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FOR THE YEAR

1920

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U. S. NAVAL OBSERVATORY.

Rear Admiral T. B. HOWARD, *U. S. N.*, Retired, ***Superintendent.***

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NOTE.—Those whose names are printed in italics devote only a small portion of their time to work of the Nautical Almanac Office.

January, 1918.

PREFACE.

This volume of the *American Nautical Almanac* was prepared under the immediate supervision of Professor W. S. EICHELBERGER, U. S. N., the Director, and follows the arrangement of the immediately preceding volumes.

The declination of the Sun, the equation of time, the right ascension and declination of the Moon, and its parallax and semidiameter are given for each even hour throughout the year; the right ascension, declination, and time of transit of Venus, Mars, Jupiter, and Saturn are given for every day of the year. The apparent places of 55 stars and their times of transit at Greenwich are given for the first of each month and the mean places of 110 additional stars follow. There are also given the elements and circumstances of the eclipses and charts of the solar eclipses; a concise statement of predictions of celestial phenomena; a table for finding the latitude by an observed altitude of Polaris; tables for the conversion of sidereal into solar time and *vice versa;* a table to enable one to obtain from the Almanac for 1920 an approximate solar ephemeris for subsequent years; and tables for finding the times of rising and setting of the Sun and Moon.

A full statement of the data from which the various ephemerides are derived will be found in the *American Ephemeris and Nautical Almanac* for 1920.

T. B. HOWARD,
Rear Admiral, U. S. Navy, Retired,
Superintendent Naval Observatory.

WASHINGTON, *January, 1918.*

PREFACE.

CONTENTS.

ANNIVERSARIES AND FESTIVALS, 1920.

New Year's Day	Thursday,	Jan. 1.
Epiphany	Tuesday,	Jan. 6.
Septuagesima Sunday	Sunday,	Feb. 1.
Lincoln's Birthday	Thursday,	Feb. 12.
Quinquagesima (Shrove Sunday)	Sunday,	Feb. 15.
Ash Wednesday	Wednesday,	Feb. 18.
Washington's Birthday	Sunday,	Feb. 22.
Palm Sunday	Sunday,	Mar. 28.
Good Friday	Friday,	Apr. 2.
First Day of Passover	Saturday,	Apr. 3.
Easter Sunday	Sunday,	Apr. 4.
Rogation Sunday	Sunday,	May 9.
Ascension Day	Thursday,	May 13.
Hebrew Pentecost (Shebuoth)	Sunday,	May 23.
Pentecost (Whit Sunday)	Sunday,	May 23.
Trinity Sunday	Sunday,	May 30.
Memorial Day	Sunday,	May 30.
Corpus Christi	Thursday,	June 3.
Independence Day	Sunday,	July 4.
Labor Day	Monday,	Sept. 6.
Hebrew New Year (Rosh Hashanah)	Monday,	Sept. 13.
Day of Atonement (Yom Kippur)	Wednesday,	Sept. 22.
First Day of Tabernacle (Sucoth)	Monday,	Sept. 27.
Columbus Day	Tuesday,	Oct. 12.
General Election Day	Tuesday,	Nov. 2.
Thanksgiving Day	Thursday,	Nov. 25.
First Sunday in Advent	Sunday,	Nov. 28.
Christmas Day	Saturday,	Dec. 25.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

The year 1920 of the Christian era comprises the latter part of the 144th and the beginning of the 145th year of the independence of the United States of America, and corresponds to the year 6633 of the Julian period.

Of the peoples using the Christian era some employ the Gregorian calendar and some the Julian. January 1, 1920, Julian calendar, corresponds to January 14, 1920, Gregorian calendar.

The year 7429 of the Byzantine era begins on September 1, 1920, Julian calendar.

The year 5681 of the Jewish era begins at sunset on September 12, 1920, Gregorian calendar.

The year 2673 since the foundation of Rome, according to VARRO, begins on January 1, 1920, Julian calendar.

The year 2669 of the era of NABONASSAR begins on April 30, 1920, Julian calendar.

The year 2580 of the Japanese era, being the 9th year of the period Taisho, begins on January 1, 1920, Gregorian calendar.

The year 2232 of the Grecian era, or the era of the SELEUCIDÆ, begins in the present-day usage of the Syrians on September 1, 1920, or on October 1, 1920, Julian calendar, according to different sects; but in the ancient usage of Damascus and Arabia Petræa the year began with the vernal equinox.

The year 1637 of the era of DIOCLETIAN begins on August 29, 1920, Julian calendar.

The year 1339 of the Mohammedan era, or the era of the Hegira, begins at sunset on September 14, 1920, Gregorian calendar.

2 422 325 is the Julian day number of January 1, 1920, Gregorian calendar.

CHRONOLOGICAL CYCLES.

Dominical Letters . . .	DC	Solar Cycle	25
Epact	10	Roman Indiction . . .	3
Lunar Cycle or Golden Number	2	Julian Period	6633

ASTRONOMICAL CONSTANTS.

Solar Parallax . . . . . 8.80 } Paris Conference.
Constant of Nutation . . . . . 9.21 }
Constant of Aberration . . . . . 20.47 }
General Precession . . . . . 50″.2564+0″.000 222(t−1900) } Newcomb.
Obliquity of the Ecliptic . . . . . 23° 27′ 8″.26−0″.4684(t−1900) }
Equatorial Horizontal Parallax of the Moon . . . . . 57′ 2″.63* (Newcomb).
Mean distance Earth to Moon 384 411 kilometers=238 862 statute miles or 60.2678 radii.
Mean distance Earth to Sun 149 504 201 kilometers=92 897 416 statute miles.
Velocity of light 299 860 kilometers=186 324 statute miles per second (Newcomb and Michelson).
Light travels unit distance in 498^s.580.
Gaussian Gravitation Constant, †k=0.017 202 099=3 548″.187 61.
Acceleration in one second due to gravity, $g=9^m.8060-0^m.0260\cos 2\varphi-\frac{2h}{R}g$.‡ } Helmert.
Length of seconds pendulum, $l=0^m.993\,549-0^m.002\,631\cos 2\varphi-\frac{2h}{R}l$. ‡ }

Length of the year:

Tropical (ordinary)	$365^d.242\,198\,79-0^d.000\,000\,0614\,(t-1900)$	Newcomb.
Sidereal	$365^d.256\,360\,42+0^d.000\,000\,0011\,(t-1900)$	
Anomalistic	$365^d.259\,641\,34+0^d.000\,000\,0304\,(t-1900)$	
Eclipse	$346^d.620\,000\,+0^d.000\,000\,36\,(t-1900)$	

Length of the month:

Synodical (ordinary)	29^d.530 588−29^d 12^h 44^m 2.8^s	Hansen.
Tropical	27.321 582−27 7 43 4.7	
Sidereal	27.321 661−27 7 43 11.5	
Anomalistic	27.554 550−27 13 18 33.1	
Nodical	27.212 219−27 5 5 35.7	

Length of the day:

Sidereal	23^h 56^m 4.091^s of mean solar time.
Mean Solar	24 3 56.555 of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, a=6378.388 kilometers or 3963.34 statute miles.
Polar Radius, b=6356.909 " or 3949.99 " "
Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}$=log e=8.913 804

Logarithm radius=log ρ=9.999 2695+0.000 7324 cos 2φ−0.000 0019 cos 4φ.
Reduction from geographic latitude φ to geocentric latitude φ',
$\varphi'-\varphi=-11'\,35''.66\sin 2\varphi+1''.17\sin 4\varphi$.

1 degree of latitude (in statute miles)=69.0569−0.3494 cos 2φ+0.0007 cos 4φ.
1 degree of longitude (in statute miles)=69.2316 cos φ−0.0584 cos 3φ+0.0001 cos 5φ.

1 meter=3.280 8333 feet. 1 foot=0.304 8006 meters.
1 statute mile=0.868 362 nautical or geographical miles.
1 nautical mile=1.151 594 statute miles.

* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is 57′ 2″.23 (Hansen).
† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.
‡ φ=latitude, h=elevation above sea level in meters, and log R=6.80416.

NOTE.—The above values of log ρ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At Unit Distance.	At Mean Least Distance. †	In Kilometers.	In Statute Miles.	Authority.
	"	"			
Sun	15 59.63	....	695 553.46	432 196.01	Auwers.
Moon	15 32.58*	....	1 738.02	1 079.96	Newcomb.
Mercury	3.34	5.45	2 420.89	1 504.27	Le Verrier.
Venus	8.41	30.40	6 095.71	3 787.69	Auwers.
Mars	4.68	8.94	3 392.14	2 107.78	Hartwig.
Jupiter (Equatorial)	1 38.47	23.43	71 372.71	44 348.86	Sampson.
Jupiter (Polar)	1 31.91	21.87	66 617.91	41 394.37	Sampson.
Saturn (Equatorial)	1 23.33	9.76	60 398.99	37 530.11	Struve.
Saturn (Polar)	1 14.57	8.73	54 049.59	33 584.79	Struve.
Uranus	34.28	1.88	24 546.72	15 439.00	Barnard, See, Wirtz.
Neptune	36.56	1.26	26 499.30	16 465.87	Barnard.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH JANUARY 1, 1920, G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal Mean Daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			"		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6183
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8111
⊕ Earth	1.000 000	1.000 04	3 548.193	....	0.016 7427
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3271
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3703
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8207
♅ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 1006
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5460

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
☿ Mercury	7 0 11.7	47 22 58.8	76 12 38.9	192 59 35.68	3.221 8487−10
♀ Venus	3 23 37.8	75 57 34.7	130 26 43.4	166 36 34.01	4.389 3398−10
⊕ Earth	.....	.....	101 33 52.9	99 51 1.71	4.482 2896−10
♂ Mars	1 51 0.9	48 56 24.7	334 35 11.8	162 5 14.93	3.509 5499−10
♃ Jupiter	1 18 27.5	99 38 24.4	13 2 1.6	125 18 37.06	6.979 9082−10
♄ Saturn	2 29 29.4	112 57 28.8	91 28 49.8	151 16 1.45	6.455 7335−10
♅ Uranus	0 46 22.0	73 35 27.1	169 22 7.5	329 20 34.67	5.640 7528−10
♆ Neptune	1 46 38.4	130 53 55.5	43 55 49.6	128 59 52.84	5.705 5338−10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1920 by applying LE VERRIER'S variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

* At mean distance. See *Ast. Papers Am. Eph.*, Vol. IX, p. 39.

† By mean least distance is meant the difference between the mean distance and unity.

SYMBOLS AND ABBREVIATIONS.

SIGNS OF THE PLANETS, ETC.

☉	The Sun.	♂	Mars.
☾	The Moon.	♃	Jupiter.
☿	Mercury.	♄	Saturn.
♀	Venus.	♅	Uranus.
⊕	The Earth.	♆	Neptune.

SIGNS OF THE ZODIAC.

Spring Signs.	1.	♈	Aries.	Autumn Signs.	7.	♎	Libra.
	2.	♉	Taurus.		8.	♏	Scorpius.
	3.	♊	Gemini.		9.	♐	Sagittarius.
Summer Signs.	4.	♋	Cancer.	Winter Signs.	10.	♑	Capricornus.
	5.	♌	Leo.		11.	♒	Aquarius.
	6.	♍	Virgo.		12.	♓	Pisces.

ASPECTS.

☌	Conjunction, or having the same Longitude or Right Ascension.
□	Quadrature, or differing ±90° in Longitude or Right Ascension.
☍	Opposition, or differing 180° in Longitude or Right Ascension.

ABBREVIATIONS.

☊	Ascending Node.	°	Degrees.
☋	Descending Node.	′	Minutes of Arc.
N.	North.	″	Seconds of Arc.
S.	South.	h	Hours.
E.	East.	m	Minutes of Time.
W.	West.	s	Seconds of Time.
x			

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Day of Month.	Right Ascension of the Mean Sun at Greenwich Mean Noon.					
	January.	February.	March.	April.	May.	June.
	h m s	h m s	h m s	h m s	h m s	h m s
1	18 39 23.6	20 41 36.9	22 35 56.9	0 38 10.0	2 36 26.6	4 38 39.9
2	18 43 20.2	20 45 33.4	22 39 53.5	0 42 6.6	2 40 23.2	4 42 36.4
3	18 47 16.7	20 49 30.0	22 43 50.0	0 46 3.2	2 44 19.8	4 46 33.0
4	18 51 13.3	20 53 26.5	22 47 46.6	0 49 59.7	2 48 16.3	4 50 29.5
5	18 55 9.8	20 57 23.1	22 51 43.2	0 53 56.3	2 52 12.9	4 54 26.1
6	18 59 6.4	21 1 19.6	22 55 39.7	0 57 52.8	2 56 9.4	4 58 22.6
7	19 3 3.0	21 5 16.2	22 59 36.2	1 1 49.4	3 0 6.0	5 2 19.2
8	19 6 59.5	21 9 12.8	23 3 32.8	1 5 45.9	3 4 2.5	5 6 15.8
9	19 10 56.1	21 13 9.3	23 7 29.4	1 9 42.5	3 7 59.1	5 10 12.3
10	19 14 52.6	21 17 5.9	23 11 25.9	1 13 39.0	3 11 55.6	5 14 8.9
11	19 18 49.2	21 21 2.4	23 15 22.5	1 17 35.6	3 15 52.2	5 18 5.4
12	19 22 45.8	21 24 59.0	23 19 19.0	1 21 32.1	3 19 48.8	5 22 2.0
13	19 26 42.3	21 28 55.5	23 23 15.6	1 25 28.7	3 23 45.3	5 25 58.6
14	19 30 38.9	21 32 52.1	23 27 12.1	1 29 25.2	3 27 41.9	5 29 55.1
15	19 34 35.4	21 36 48.6	23 31 8.7	1 33 21.8	3 31 38.4	5 33 51.7
16	19 38 32.0	21 40 45.2	23 35 5.2	1 37 18.3	3 35 35.0	5 37 48.2
17	19 42 28.5	21 44 41.8	23 39 1.8	1 41 14.9	3 39 31.5	5 41 44.8
18	19 46 25.1	21 48 38.3	23 42 58.3	1 45 11.4	3 43 28.1	5 45 41.3
19	19 50 21.6	21 52 34.8	23 46 54.9	1 49 8.0	3 47 24.6	5 49 37.9
20	19 54 18.2	21 56 31.4	23 50 51.4	1 53 4.6	3 51 21.2	5 53 34.4
21	19 58 14.8	22 0 28.0	23 54 48.0	1 57 1.1	3 55 17.8	5 57 31.0
22	20 2 11.3	22 4 24.5	23 58 44.5	2 0 57.7	3 59 14.3	6 1 27.6
23	20 6 7.9	22 8 21.1	0 2 41.1	2 4 54.2	4 3 10.9	6 5 24.1
24	20 10 4.4	22 12 17.6	0 6 37.6	2 8 50.8	4 7 7.4	6 9 20.7
25	20 14 1.0	22 16 14.2	0 10 34.2	2 12 47.3	4 11 4.0	6 13 17.2
26	20 17 57.5	22 20 10.7	0 14 30.7	2 16 43.9	4 15 0.5	6 17 13.8
27	20 21 54.1	22 24 7.3	0 18 27.3	2 20 40.4	4 18 57.1	6 21 10.4
28	20 25 50.6	22 28 3.8	0 22 23.8	2 24 37.0	4 22 53.6	6 25 6.9
29	20 29 47.2	22 32 0.4	0 26 20.4	2 28 33.5	4 26 50.2	6 29 3.5
30	20 33 43.8	22 35 56.9	0 30 17.0	2 32 30.1	4 30 46.8	6 33 0.0
31	20 37 40.3	22 39 53.5	0 34 13.5	2 36 26.6	4 34 43.3	6 36 56.6

CORRECTION TO BE ADDED TO R. A. M. S. AT G. M. N. FOR TIME PAST NOON.

Time.	0m	6m	12m	18m	24m	30m	36m	42m	48m	54m	60m	Time.
h	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	h
0	0 0.0	0 1.0	0 2.0	0 3.0	0 3.9	0 4.9	0 5.9	0 6.9	0 7.9	0 8.9	0 9.9	0
1	0 9.9	0 10.8	0 11.8	0 12.8	0 13.8	0 14.8	0 15.8	0 16.8	0 17.7	0 18.7	0 19.7	1
2	0 19.7	0 20.7	0 21.7	0 22.7	0 23.7	0 24.6	0 25.6	0 26.6	0 27.6	0 28.6	0 29.6	2
3	0 29.6	0 30.6	0 31.5	0 32.5	0 33.5	0 34.5	0 35.5	0 36.5	0 37.5	0 38.4	0 39.4	3
4	0 39.4	0 40.4	0 41.4	0 42.4	0 43.4	0 44.4	0 45.3	0 46.3	0 47.3	0 48.3	0 49.3	4
5	0 49.3	0 50.3	0 51.3	0 52.2	0 53.2	0 54.2	0 55.2	0 56.2	0 57.2	0 58.2	0 59.1	5
6	0 59.1	1 0.1	1 1.1	1 2.1	1 3.1	1 4.1	1 5.1	1 6.0	1 7.0	1 8.0	1 9.0	6
7	1 9.0	1 10.0	1 11.0	1 12.0	1 12.9	1 13.9	1 14.9	1 15.9	1 16.9	1 17.9	1 18.9	7
8	1 18.9	1 19.8	1 20.8	1 21.8	1 22.8	1 23.8	1 24.8	1 25.8	1 26.7	1 27.7	1 28.7	8
9	1 28.7	1 29.7	1 30.7	1 31.7	1 32.7	1 33.6	1 34.6	1 35.6	1 36.6	1 37.6	1 38.6	9
10	1 38.6	1 39.6	1 40.5	1 41.5	1 42.5	1 43.5	1 44.5	1 45.5	1 46.5	1 47.4	1 48.4	10
11	1 48.4	1 49.4	1 50.4	1 51.4	1 52.4	1 53.3	1 54.3	1 55.3	1 56.3	1 57.3	1 58.3	11

Day of Month.	Right Ascension of the Mean Sun at Greenwich Mean Noon.					
	July.	August.	September.	October.	November.	December.
	h m s	h m s	h m s	h m s	h m s	h m s
1	6 36 56.6	8 39 9.8	10 41 23.0	12 39 39.6	14 41 52.7	16 40 9.4
2	6 40 53.1	8 43 6.4	10 45 19.5	12 43 36.1	14 45 49.2	16 44 5.9
3	6 44 49.7	8 47 2.9	10 49 16.1	12 47 32.6	14 49 45.8	16 48 2.5
4	6 48 46.2	8 50 59.5	10 53 12.6	12 51 29.2	14 53 42.3	16 51 59.0
5	6 52 42.8	8 54 56.0	10 57 9.2	12 55 25.8	14 57 38.9	16 55 55.6
6	6 56 39.4	8 58 52.6	11 1 5.8	12 59 22.3	15 1 35.4	16 59 52.1
7	7 0 35.9	9 2 49.1	11 5 2.3	13 3 18.9	15 5 32.0	17 3 48.7
8	7 4 32.5	9 6 45.7	11 8 58.8	13 7 15.4	15 9 28.6	17 7 45.2
9	7 8 29.0	9 10 42.2	11 12 55.4	13 11 12.0	15 13 25.1	17 11 41.8
10	7 12 25.6	9 14 38.8	11 16 52.0	13 15 8.5	15 17 21.7	17 15 38.4
11	7 16 22.1	9 18 35.4	11 20 48.5	13 19 5.1	15 21 18.2	17 19 34.9
12	7 20 18.7	9 22 31.9	11 24 45.1	13 23 1.6	15 25 14.8	17 23 31.5
13	7 24 15.3	9 26 28.5	11 28 41.6	13 26 58.2	15 29 11.3	17 27 28.0
14	7 28 11.8	9 30 25.0	11 32 38.2	13 30 54.7	15 33 7.9	17 31 24.6
15	7 32 8.4	9 34 21.6	11 36 34.7	13 34 51.3	15 37 4.4	17 35 21.2
16	7 36 4.9	9 38 18.1	11 40 31.3	13 38 47.8	15 41 1.0	17 39 17.7
17	7 40 1.5	9 42 14.7	11 44 27.8	13 42 44.4	15 44 57.6	17 43 14.3
18	7 43 58.0	9 46 11.2	11 48 24.4	13 46 40.9	15 48 54.1	17 47 10.8
19	7 47 54.6	9 50 7.8	11 52 20.9	13 50 37.5	15 52 50.7	17 51 7.4
20	7 51 51.2	9 54 4.4	11 56 17.5	13 54 34.0	15 56 47.2	17 55 3.9
21	7 55 47.7	9 58 0.9	12 0 14.0	13 58 30.6	16 0 43.8	17 59 0.5
22	7 59 44.3	10 1 57.5	12 4 10.6	14 2 27.2	16 4 40.3	18 2 57.0
23	8 3 40.8	10 5 54.0	12 8 7.1	14 6 23.7	16 8 36.9	18 6 53.6
24	8 7 37.4	10 9 50.6	12 12 3.7	14 10 20.2	16 12 33.4	18 10 50.2
25	8 11 33.9	10 13 47.1	12 16 0.2	14 14 16.8	16 16 30.0	18 14 46.7
26	8 15 30.5	10 17 43.7	12 19 56.8	14 18 13.4	16 20 26.6	18 18 43.3
27	8 19 27.0	10 21 40.2	12 23 53.3	14 22 9.9	16 24 23.1	18 22 39.8
28	8 23 23.6	10 25 36.8	12 27 49.9	14 26 6.5	16 28 19.7	18 26 36.4
29	8 27 20.2	10 29 33.3	12 31 46.4	14 30 3.0	16 32 16.2	18 30 33.0
30	8 31 16.7	10 33 29.9	12 35 43.0	14 33 59.6	16 36 12.8	18 34 29.5
31	8 35 13.3	10 37 26.4	12 39 39.6	14 37 56.1	16 40 9.4	18 38 26.1

CORRECTION TO BE ADDED TO R. A. M. S. AT G. M. N. FOR TIME PAST NOON.

Time.	0m	6m	12m	18m	24m	30m	36m	42m	48m	54m	60m	Time.
h	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	h
12	1 58.3	1 59.3	2 0.2	2 1.2	2 2.2	2 3.2	2 4.2	2 5.2	2 6.2	2 7.1	2 8.1	12
13	2 8.1	2 9.1	2 10.1	2 11.1	2 12.1	2 13.1	2 14.0	2 15.0	2 16.0	2 17.0	2 18.0	13
14	2 18.0	2 19.0	2 20.0	2 20.9	2 21.9	2 22.9	2 23.9	2 24.9	2 25.9	2 26.9	2 27.8	14
15	2 27.8	2 28.8	2 29.8	2 30.8	2 31.8	2 32.8	2 33.8	2 34.7	2 35.7	2 36.7	2 37.7	15
16	2 37.7	2 38.7	2 39.7	2 40.7	2 41.6	2 42.6	2 43.6	2 44.6	2 45.6	2 46.6	2 47.6	16
17	2 47.6	2 48.5	2 49.5	2 50.5	2 51.5	2 52.5	2 53.5	2 54.5	2 55.4	2 56.4	2 57.4	17
18	2 57.4	2 58.4	2 59.4	3 0.4	3 1.4	3 2.3	3 3.3	3 4.3	3 5.3	3 6.3	3 7.3	18
19	3 7.3	3 8.3	3 9.2	3 10.2	3 11.2	3 12.2	3 13.2	3 14.2	3 15.2	3 16.1	3 17.1	19
20	3 17.1	3 18.1	3 19.1	3 20.1	3 21.1	3 22.1	3 23.0	3 24.0	3 25.0	3 26.0	3 27.0	20
21	3 27.0	3 28.0	3 29.0	3 29.9	3 30.9	3 31.9	3 32.9	3 33.9	3 34.9	3 35.9	3 36.8	21
22	3 36.8	3 37.8	3 38.8	3 39.8	3 40.8	3 41.8	3 42.8	3 43.7	3 44.7	3 45.7	3 46.7	22
23	3 46.7	3 47.7	3 48.7	3 49.7	3 50.6	3 51.6	3 52.6	3 53.6	3 54.6	3 55.6	3 56.6	23

Day of Month.	Mean Time of Sidereal Noon at Greenwich.					
	January.	February.	March.	April.	May.	June.
	h m s	h m s	h m s	h m s	h m s	h m s
1	5 19 43.9	3 17 50.6	1 23 49.3	23 18 0.3	21 20 3.1	19 18 9.9
2	5 15 47.9	3 13 54.7	1 19 53.4	23 14 4.4	21 16 7.2	19 14 14.0
3	5 11 52.0	3 9 58.8	1 15 57.5	23 10 8.5	21 12 11.3	19 10 18.1
4	5 7 56.1	3 6 2.9	1 12 1.6	23 6 12.6	21 8 15.4	19 6 22.1
5	5 4 0.2	3 2 7.0	1 8 5.7	23 2 16.7	21 4 19.4	19 2 26.2
6	5 0 4.3	2 58 11.1	1 4 9.8	22 58 20.8	21 0 23.5	18 58 30.3
7	4 56 8.4	2 54 15.2	1 0 13.8	22 54 24.8	20 56 27.6	18 54 34.4
8	4 52 12.5	2 50 19.3	0 56 18.0	22 50 28.9	20 52 31.7	18 50 38.5
9	4 48 16.6	2 46 23.4	0 52 22.0	22 46 33.0	20 48 35.8	18 46 42.6
10	4 44 20.6	2 42 27.4	0 48 26.1	22 42 37.1	20 44 39.9	18 42 46.7
11	4 40 24.7	2 38 31.5	0 44 30.2	22 38 41.2	20 40 44.0	18 38 50.8
12	4 36 28.8	2 34 35.6	0 40 34.3	22 34 45.3	20 36 48.1	18 34 54.9
13	4 32 32.9	2 30 39.7	0 36 38.4	22 30 49.4	20 32 52.2	18 30 58.9
14	4 28 37.0	2 26 43.8	0 32 42.5	22 26 53.5	20 28 56.3	18 27 3.0
15	4 24 41.1	2 22 47.9	0 28 46.6	22 22 57.6	20 25 0.4	18 23 7.1
16	4 20 45.2	2 18 52.0	0 24 50.7	22 19 1.7	20 21 4.4	18 19 11.2
17	4 16 49.3	2 14 56.1	0 20 54.8	22 15 5.8	20 17 8.5	18 15 15.3
18	4 12 53.4	2 11 0.2	0 16 58.9	22 11 9.9	20 13 12.6	18 11 19.4
19	4 8 57.4	2 7 4.3	0 13 3.0	22 7 14.0	20 9 16.7	18 7 23.5
20	4 5 1.5	2 3 8.4	0 9 7.1	22 3 18.1	20 5 20.8	18 3 27.6
21	4 1 5.6	1 59 12.5	0 5 11.2	21 59 22.2	20 1 24.9	17 59 31.7
22	3 57 9.7	1 55 16.6	{0 1 15.3 / 23 57 19.4}	21 55 26.2	19 57 29.0	17 55 35.7
23	3 53 13.8	1 51 20.6	23 53 23.4	21 51 30.3	19 53 33.1	17 51 39.8
24	3 49 17.9	1 47 24.7	23 49 27.5	21 47 34.4	19 49 37.2	17 47 43.9
25	3 45 22.0	1 43 28.8	23 45 31.6	21 43 38.5	19 45 41.2	17 43 48.0
26	3 41 26.1	1 39 32.9	23 41 35.7	21 39 42.6	19 41 45.3	17 39 52.1
27	3 37 30.2	1 35 37.0	23 37 39.8	21 35 46.7	19 37 49.4	17 35 56.2
28	3 33 34.3	1 31 41.1	23 33 43.9	21 31 50.8	19 33 53.5	17 32 0.3
29	3 29 38.4	1 27 45.2	23 29 48.0	21 27 54.9	19 29 57.6	17 28 4.4
30	3 25 42.4	1 23 49.3	23 25 52.1	21 23 59.0	19 26 1.7	17 24 8.5
31	3 21 46.5	1 19 53.4	23 21 56.2	21 20 3.1	19 22 5.8	17 20 12.5

CORRECTION FOR LONGITUDE.

Longitude.	0m	6m	12m	18m	24m	30m	36m	42m	48m	54m	60m	Longitude.
h	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	h
0	0 0.0	0 1.0	0 2.0	0 2.9	0 3.9	0 4.9	0 5.9	0 6.9	0 7.9	0 8.8	0 9.8	0
1	0 9.8	0 10.8	0 11.8	0 12.8	0 13.8	0 14.7	0 15.7	0 16.7	0 17.7	0 18.7	0 19.7	1
2	0 19.7	0 20.6	0 21.6	0 22.6	0 23.6	0 24.6	0 25.6	0 26.5	0 27.5	0 28.5	0 29.5	2
3	0 29.5	0 30.5	0 31.5	0 32.4	0 33.4	0 34.4	0 35.4	0 36.4	0 37.4	0 38.3	0 39.3	3
4	0 39.3	0 40.3	0 41.3	0 42.3	0 43.2	0 44.2	0 45.2	0 46.2	0 47.2	0 48.2	0 49.1	4
5	0 49.1	0 50.1	0 51.1	0 52.1	0 53.1	0 54.1	0 55.0	0 56.0	0 57.0	0 58.0	0 59.0	5
6	0 59.0	1 0.0	1 0.9	1 1.9	1 2.9	1 3.9	1 4.9	1 5.9	1 6.8	1 7.8	1 8.8	6
7	1 8.8	1 9.8	1 10.8	1 11.8	1 12.7	1 13.7	1 14.7	1 15.7	1 16.7	1 17.7	1 18.6	7
8	1 18.6	1 19.6	1 20.6	1 21.6	1 22.6	1 23.6	1 24.5	1 25.5	1 26.5	1 27.5	1 28.5	8
9	1 28.5	1 29.4	1 30.4	1 31.4	1 32.4	1 33.4	1 34.4	1 35.3	1 36.3	1 37.3	1 38.3	9
10	1 38.3	1 39.3	1 40.3	1 41.2	1 42.2	1 43.2	1 44.2	1 45.2	1 46.2	1 47.1	1 48.1	10
11	1 48.1	1 49.1	1 50.1	1 51.1	1 52.1	1 53.0	1 54.0	1 55.0	1 56.0	1 57.0	1 58.0	11

NOTE.—To be subtracted from M. T. S. N. at Greenwich to obtain M. T. S. N. at any longitude west of Greenwich. The correction must be added when the longitude is east of Greenwich.

Day of Month.	Mean Time of Sidereal Noon at Greenwich.					
	July.	August.	September.	October.	November.	December.
	h m s	h m s	h m s	h m s	h m s	h m s
1	17 20 12.5	15 18 19.3	13 16 26.2	11 18 29.0	9 16 35.9	7 18 38.6
2	17 16 16.6	15 14 23.4	13 12 30.3	11 14 33.1	9 12 40.0	7 14 42.7
3	17 12 20.7	15 10 27.5	13 8 34.4	11 10 37.2	9 8 44.1	7 10 46.8
4	17 8 24.8	15 6 31.6	13 4 38.5	11 6 41.3	9 4 48.2	7 6 50.9
5	17 4 28.9	15 2 35.7	13 0 42.6	11 2 45.4	9 0 52.2	7 2 55.0
6	17 0 33.0	14 58 39.8	12 56 46.6	10 58 49.5	8 56 56.3	6 58 59.0
7	16 56 37.1	14 54 43.9	12 52 50.7	10 54 53.6	8 53 0.4	6 55 3.1
8	16 52 41.2	14 50 48.0	12 48 54.8	10 50 57.7	8 49 4.5	6 51 7.2
9	16 48 45.3	14 46 52.1	12 44 58.9	10 47 1.8	8 45 8.6	6 47 11.3
10	16 44 49.3	14 42 56.2	12 41 3.0	10 43 5.8	8 41 12.7	6 43 15.4
11	16 40 53.4	14 39 0.2	12 37 7.1	10 39 9.9	8 37 16.8	6 39 19.5
12	16 36 57.5	14 35 4.3	12 33 11.2	10 35 14.0	8 33 20.9	6 35 23.6
13	16 33 1.6	14 31 8.4	12 29 15.3	10 31 18.1	8 29 25.0	6 31 27.7
14	16 29 5.7	14 27 12.5	12 25 19.4	10 27 22.2	8 25 29.1	6 27 31.8
15	16 25 9.8	14 23 16.6	12 21 23.5	10 23 26.3	8 21 33.2	6 23 35.8
16	16 21 13.9	14 19 20.7	12 17 27.6	10 19 30.4	8 17 37.2	6 19 39.9
17	16 17 18.0	14 15 24.8	12 13 31.7	10 15 34.5	8 13 41.3	6 15 44.0
18	16 13 22.1	14 11 28.9	12 9 35.8	10 11 38.6	8 9 45.4	6 11 48.1
19	16 9 26.2	14 7 33.0	12 5 39.9	10 7 42.7	8 5 49.5	6 7 52.2
20	16 5 30.2	14 3 37.1	12 1 44.0	10 3 46.8	8 1 53.6	6 3 56.3
21	16 1 34.3	13 59 41.2	11 57 48.1	9 59 50.9	7 57 57.7	6 0 0.4
22	15 57 38.4	13 55 45.2	11 53 52.2	9 55 55.0	7 54 1.8	5 56 4.5
23	15 53 42.5	13 51 49.3	11 49 56.2	9 51 59.0	7 50 5.9	5 52 8.5
24	15 49 46.6	13 47 53.4	11 46 0.3	9 48 3.1	7 46 10.0	5 48 12.6
25	15 45 50.7	13 43 57.5	11 42 4.4	9 44 7.2	7 42 14.1	5 44 16.7
26	15 41 54.8	13 40 1.6	11 38 8.5	9 40 11.3	7 38 18.2	5 40 20.8
27	15 37 58.9	13 36 5.7	11 34 12.6	9 36 15.4	7 34 22.2	5 36 24.9
28	15 34 3.0	13 32 9.8	11 30 16.7	9 32 19.5	7 30 26.3	5 32 29.0
29	15 30 7.0	13 28 13.9	11 26 20.8	9 28 23.6	7 26 30.4	5 28 33.1
30	15 26 11.1	13 24 18.0	11 22 24.9	9 24 27.7	7 22 34.5	5 24 37.2
31	15 22 15.2	13 20 22.1	11 18 29.0	9 20 31.8	7 18 38.6	5 20 41.2

CORRECTION FOR LONGITUDE.

Longitude.	0m	6m	12m	18m	24m	30m	36m	42m	48m	54m	60m	Longitude.
h	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	h
12	1 58.0	1 58.9	1 59.9	2 0.9	2 1.9	2 2.9	2 3.9	2 4.8	2 5.8	2 6.8	2 7.8	12
13	2 7.8	2 8.8	2 9.7	2 10.7	2 11.7	2 12.7	2 13.7	2 14.7	2 15.6	2 16.6	2 17.6	13
14	2 17.6	2 18.6	2 19.6	2 20.6	2 21.5	2 22.5	2 23.5	2 24.5	2 25.5	2 26.5	2 27.4	14
15	2 27.4	2 28.4	2 29.4	2 30.4	2 31.4	2 32.4	2 33.3	2 34.3	2 35.3	2 36.3	2 37.3	15
16	2 37.3	2 38.3	2 39.2	2 40.2	2 41.2	2 42.2	2 43.2	2 44.2	2 45.1	2 46.1	2 47.1	16
17	2 47.1	2 48.1	2 49.1	2 50.1	2 51.0	2 52.0	2 53.0	2 54.0	2 55.0	2 55.9	2 56.9	17
18	2 56.9	2 57.9	2 58.9	2 59.9	3 0.9	3 1.8	3 2.8	3 3.8	3 4.8	3 5.8	3 6.8	18
19	3 6.8	3 7.7	3 8.7	3 9.7	3 10.7	3 11.7	3 12.7	3 13.6	3 14.6	3 15.6	3 16.6	19
20	3 16.6	3 17.6	3 18.6	3 19.5	3 20.5	3 21.5	3 22.5	3 23.5	3 24.5	3 25.4	3 26.4	20
21	3 26.4	3 27.4	3 28.4	3 29.4	3 30.4	3 31.3	3 32.3	3 33.3	3 34.3	3 35.3	3 36.2	21
22	3 36.2	3 37.2	3 38.2	3 39.2	3 40.2	3 41.2	3 42.1	3 43.1	3 44.1	3 45.1	3 46.1	22
23	3 46.1	3 47.1	3 48.0	3 49.0	3 50.0	3 51.0	3 52.0	3 53.0	3 53.9	3 54·9	3 55.9	23

NOTE.—To be subtracted from M. T. S. N. at Greenwich to obtain M. T. S. N. at any longitude west of Greenwich. The correction must be added when the longitude is east of Greenwich.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Thursday 1.		Monday 5.		Friday 9.		Tuesday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−23 5.2	−3 13.0	−22 43.5	−5 4.7	−22 14.7	−6 49.8	−21 38.9	−8 26.7
2	23 4.8	3 15.4	22 43.0	5 7.0	22 14.0	6 51.9	21 38.0	8 28.6
4	23 4.4	3 17.8	22 42.5	5 9.2	22 13.3	6 54.0	21 37.2	8 30.6
6	23 4.0	3 20.2	22 41.9	5 11.5	22 12.7	6 56.1	21 36.4	8 32.5
8	23 3.7	3 22.6	22 41.4	5 13.7	22 12.0	6 58.2	21 35.6	8 34.4
10	23 3.3	3 24.9	22 40.9	5 16.0	22 11.3	7 0.3	21 34.7	8 36.3
12	23 2.9	3 27.3	22 40.3	5 18.2	22 10.6	7 2.3	21 33.9	8 38.2
14	23 2.5	3 29.7	22 39.8	5 20.5	22 9.9	7 4.4	21 33.1	8 40.1
16	23 2.1	3 32.0	22 39.2	5 22.7	22 9.2	7 6.5	21 32.2	8 42.0
18	23 1.7	3 34.4	22 38.7	5 24.9	22 8.5	7 8.6	21 31.4	8 43.9
20	23 1.3	3 36.8	22 38.1	5 27.2	22 7.8	7 10.7	21 30.5	8 45.8
22	23 0.9	3 39.1	22 37.6	5 29.4	22 7.1	7 12.7	21 29.7	8 47.6
H. D.	0.2	1.2	0.3	1.1	0.3	1.0	0.4	1.0
	Friday 2.		Tuesday 6.		Saturday 10.		Wednesday 14.	
0	−23 0.5	−3 41.5	−22 37.0	−5 31.6	−22 6.4	−7 14.8	−21 28.8	−8 49.5
2	23 0.0	3 43.8	22 36.4	5 33.9	22 5.7	7 16.9	21 28.0	8 51.4
4	22 59.6	3 46.2	22 35.9	5 36.1	22 4.9	7 18.9	21 27.1	8 53.3
6	22 59.2	3 48.5	22 35.3	5 38.3	22 4.2	7 21.0	21 26.3	8 55.1
8	22 58.8	3 50.9	22 34.7	5 40.5	22 3.5	7 23.0	21 25.4	8 57.0
10	22 58.4	3 53.2	22 34.1	5 42.7	22 2.8	7 25.1	21 24.5	8 58.8
12	22 57.9	3 55.6	22 33.6	5 45.0	22 2.1	7 27.1	21 23.7	9 0.7
14	22 57.5	3 57.9	22 33.0	5 47.2	22 1.3	7 29.2	21 22.8	9 2.5
16	22 57.1	4 0.3	22 32.4	5 49.4	22 0.6	7 31.2	21 21.9	9 4.4
18	22 56.6	4 2.6	22 31.8	5 51.6	21 59.9	7 33.2	21 21.0	9 6.2
20	22 56.2	4 4.9	22 31.2	5 53.8	21 59.1	7 35.3	21 20.2	9 8.1
22	22 55.7	4 7.3	22 30.6	5 56.0	21 58.4	7 37.3	21 19.3	9 9.9
H. D.	0.2	1.2	0.3	1.1	0.4	1.0	0.4	0.9
	Saturday 3.		Wednesday 7.		Sunday 11.		Thursday 15.	
0	−22 55.3	−4 9.6	−22 30.0	−5 58.1	−21 57.6	−7 39.3	−21 18.4	−9 11.7
2	22 54.8	4 11.9	22 29.4	6 0.3	21 56.9	7 41.4	21 17.5	9 13.5
4	22 54.4	4 14.3	22 28.8	6 2.5	21 56.1	7 43.4	21 16.6	9 15.3
6	22 53.9	4 16.6	22 28.2	6 4.7	21 55.4	7 45.4	21 15.7	9 17.2
8	22 53.4	4 18.9	22 27.6	6 6.9	21 54.6	7 47.4	21 14.8	9 19.0
10	22 53.0	4 21.2	22 27.0	6 9.1	21 53.9	7 49.4	21 13.9	9 20.8
12	22 52.5	4 23.5	22 26.3	6 11.2	21 53.1	7 51.4	21 13.0	9 22.6
14	22 52.0	4 25.8	22 25.7	6 13.4	21 52.3	7 53.4	21 12.1	9 24.4
16	22 51.6	4 28.1	22 25.1	6 15.6	21 51.6	7 55.4	21 11.2	9 26.1
18	22 51.1	4 30.4	22 24.5	6 17.7	21 50.8	7 57.4	21 10.3	9 27.9
20	22 50.6	4 32.7	22 23.8	6 19.9	21 50.0	7 59.4	21 9.4	9 29.7
22	22 50.1	4 35.0	22 23.2	6 22.0	21 49.2	8 1.3	21 8.5	9 31.5
H. D.	0.2	1.2	0.3	1.1	0.4	1.0	0.5	0.9
	Sunday 4.		Thursday 8.		Monday 12.		Friday 16.	
0	−22 49.6	−4 37.3	−22 22.6	−6 24.2	−21 48.5	−8 3.3	−21 7.5	−9 33.3
2	22 49.1	4 39.6	22 21.9	6 26.3	21 47.7	8 5.3	21 6.6	9 35.0
4	22 48.7	4 41.9	22 21.3	6 28.5	21 46.9	8 7.3	21 5.7	9 36.8
6	22 48.2	4 44.2	22 20.6	6 30.6	21 46.1	8 9.2	21 4.8	9 38.5
8	22 47.7	4 46.5	22 20.0	6 32.8	21 45.3	8 11.2	21 3.8	9 40.3
10	22 47.2	4 48.8	22 19.3	6 34.9	21 44.5	8 13.1	21 2.9	9 42.0
12	22 46.6	4 51.1	22 18.7	6 37.0	21 43.7	8 15.1	21 2.0	9 43.8
14	22 46.1	4 53.4	22 18.0	6 39.2	21 42.9	8 17.0	21 1.0	9 45.5
16	22 45.6	4 55.6	22 17.4	6 41.3	21 42.1	8 19.0	21 0.1	9 47.3
18	22 45.1	4 57.9	22 16.7	6 43.4	21 41.3	8 20.9	20 59.1	9 49.0
20	22 44.6	5 0.2	22 16.0	6 45.5	21 40.5	8 22.9	20 58.2	9 50.7
22	−22 44.1	−5 2.4	−22 15.4	−6 47.6	−21 39.7	−8 24.8	−20 57.2	−9 52.4
H. D.	0.3	1.1	0.3	1.1	0.4	1.0	0.5	0.9

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Saturday 17.		Wednesday 21.		Sunday 25.		Thursday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−20 56.3	− 9 54.1	−20 7.3	−11 10.7	−19 12.4	−12 15.2	−18 11.8	−13 6.8
2	20 55.3	9 55.9	20 6.3	11 12.2	19 11.1	12 16.4	18 10.4	13 7.8
4	20 54.4	9 57.6	20 5.2	11 13.6	19 9.9	12 17.6	18 9.1	13 8.7
6	20 53.4	9 59.3	20 4.1	11 15.1	19 8.7	12 18.8	18 7.8	13 9.6
8	20 52.5	10 1.0	20 3.0	11 16.5	19 7.5	12 20.0	18 6.5	13 10.5
10	20 51.5	10 2.6	20 1.9	11 18.0	19 6.3	12 21.2	18 5.1	13 11.5
12	20 50.5	10 4.3	20 0.8	11 19.4	19 5.1	12 22.4	18 3.8	13 12.4
14	20 49.5	10 6.0	19 59.7	11 20.9	19 3.9	12 23.6	18 2.5	13 13.3
16	20 48.6	10 7.7	19 58.6	11 22.3	19 2.6	12 24.7	18 1.1	13 14.2
18	20 47.6	10 9.4	19 57.5	11 23.7	19 1.4	12 25.9	17 59.8	13 15.0
20	20 46.6	10 11.0	19 56.4	11 25.2	19 0.2	12 27.1	17 58.5	13 15.9
22	20 45.6	10 12.7	19 55.2	11 26.6	18 58.9	12 28.2	17 57.1	13 16.8
H. D.	0.5	0.8	0.6	0.7	0.6	0.6	0.7	0.5
	Sunday 18.		Thursday 22.		Monday 26.		Friday 30.	
0	−20 44.6	−10 14.3	−19 54.1	−11 28.0	−18 57.7	−12 29.4	−17 55.8	−13 17.7
2	20 43.6	10 16.0	19 53.0	11 29.4	18 56.5	12 30.5	17 54.4	13 18.5
4	20 42.7	10 17.6	19 51.9	11 30.8	18 55.2	12 31.6	17 53.1	13 19.4
6	20 41.7	10 19.3	19 50.8	11 32.2	18 54.0	12 32.8	17 51.7	13 20.2
8	20 40.7	10 20.9	19 49.7	11 33.6	18 52.8	12 33.9	17 50.4	13 21.1
10	20 39.7	10 22.6	19 48.5	11 35.0	18 51.5	12 35.0	17 49.0	13 21.9
12	20 38.7	10 24.2	19 47.4	11 36.3	18 50.3	12 36.1	17 47.7	13 22.8
14	20 37.7	10 25.8	19 46.3	11 37.7	18 49.0	12 37.2	17 46.3	13 23.6
16	20 36.7	10 27.4	19 45.1	11 39.1	18 47.8	12 38.3	17 44.9	13 24.4
18	20 35.6	10 29.0	19 44.0	11 40.4	18 46.5	12 39.4	17 43.6	13 25.2
20	20 34.6	10 30.6	19 42.9	11 41.8	18 45.3	12 40.5	17 42.2	13 26.1
22	20 33.6	10 32.3	19 41.7	11 43.2	18 44.0	12 41.6	17 40.8	13 26.9
H. D.	0.5	0.8	0.6	0.7	0.6	0.6	0.7	0.4
	Monday 19.		Friday 23.		Tuesday 27.		Saturday 31.	
0	−20 32.6	−10 33.9	−19 40.6	−11 44.5	−18 42.7	−12 42.7	−17 39.5	−13 27.7
2	20 31.6	10 35.4	19 39.4	11 45.9	18 41.5	12 43.7	17 38.1	13 28.5
4	20 30.6	10 37.0	19 38.3	11 47.2	18 40.2	12 44.8	17 36.7	13 29.3
6	20 29.5	10 38.6	19 37.1	11 48.5	18 38.9	12 45.9	17 35.3	13 30.0
8	20 28.5	10 40.2	19 36.0	11 49.8	18 37.7	12 46.9	17 34.0	13 30.8
10	20 27.5	10 41.8	19 34.8	11 51.2	18 36.4	12 48.0	17 32.6	13 31.6
12	20 26.4	10 43.3	19 33.7	11 52.5	18 35.1	12 49.0	17 31.2	13 32.4
14	20 25.4	10 44.9	19 32.5	11 53.8	18 33.8	12 50.1	17 29.8	13 33.1
16	20 24.3	10 46.5	19 31.3	11 55.1	18 32.6	12 51.1	17 28.4	13 33.9
18	20 23.3	10 48.0	19 30.2	11 56.4	18 31.3	12 52.1	17 27.0	13 34.6
20	20 22.3	10 49.6	19 29.0	11 57.7	18 30.0	12 53.1	17 25.6	13 35.4
22	20 21.2	10 51.1	19 27.8	11 59.0	18 28.7	12 54.2	−17 24.3	−13 36.1
H. D.	0.5	0.8	0.6	0.7	0.6	0.5	0.7	0.4
	Tuesday 20.		Saturday 24.		Wednesday 28.			
0	−20 20.2	−10 52.6	−19 26.6	−12 0.3	−18 27.4	−12 55.2		
2	20 19.1	10 54.2	19 25.5	12 1.5	18 26.1	12 56.2		
4	20 18.0	10 55.7	19 24.3	12 2.8	18 24.8	12 57.2		
6	20 17.0	10 57.2	19 23.1	12 4.1	18 23.5	12 58.2		
8	20 15.9	10 58.7	19 21.9	12 5.3	18 22.2	12 59.2		
10	20 14.9	11 0.3	19 20.7	12 6.6	18 20.9	13 0.1		
12	20 13.8	11 1.8	19 19.5	12 7.8	18 19.6	13 1.1		
14	20 12.7	11 3.3	19 18.4	12 9.1	18 18.3	13 2.1		
16	20 11.7	11 4.8	19 17.2	12 10.3	18 17.0	13 3.0		
18	20 10.6	11 6.2	19 16.0	12 11.5	18 15.7	13 4.0		
20	20 9.5	11 7.7	19 14.8	12 12.8	18 14.4	13 5.0		
22	−20 8.4	−11 9.2	−19 13.6	−12 14.0	−18 13.1	−13 5.9		
H. D.	0.5	0.8	0.6	0.6	0.7	0.5		

SEMIDIAMETER.

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Jan. 1	16.30
11	16.30
21	16.28
31	16.27

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Sunday 1.		Thursday 5.		Monday 9.		Friday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−17 22.9	−13 36.8	−16 13.4	−14 5.2	−14 59.5	−14 20.6	−13 41.5	−14 23.5
2	17 21.5	13 37.5	16 11.9	14 5.6	14 57.9	14 20.7	13 39.8	14 23.5
4	17 20.1	13 38.3	16 10.4	14 6.0	14 56.3	14 20.9	13 38.1	14 23.4
6	17 18.7	13 39.0	16 8.9	14 6.5	14 54.7	14 21.1	13 36.5	14 23.3
8	17 17.3	13 39.7	16 7.4	14 6.9	14 53.1	14 21.3	13 34.8	14 23.2
10	17 15.9	13 40.4	16 5.9	14 7.3	14 51.5	14 21.4	13 33.1	14 23.1
12	17 14.4	13 41.1	16 4.4	14 7.8	14 49.9	14 21.6	13 31.5	14 23.0
14	17 13.0	13 41.8	16 2.9	14 8.2	14 48.3	14 21.7	13 29.8	14 22.9
16	17 11.6	13 42.5	16 1.4	14 8.6	14 46.7	14 21.9	13 28.1	14 22.8
18	17 10.2	13 43.1	15 59.9	14 9.0	14 45.1	14 22.0	13 26.4	14 22.7
20	17 8.8	13 43.8	15 58.4	14 9.4	14 43.5	14 22.2	13 24.7	14 22.6
22	17 7.4	13 44.5	15 56.9	14 9.8	14 41.9	14 22.3	13 23.1	14 22.5
H. D.	0.7	0.3	0.8	0.2	0.8	0.1	0.8	0.0
	Monday 2.		Friday 6.		Tuesday 10.		Saturday 14.	
0	−17 5.9	−13 45.1	−15 55.3	−14 10.2	−14 40.3	−14 22.4	−13 21.4	−14 22.4
2	17 4.5	13 45.8	15 53.8	14 10.6	14 38.7	14 22.6	13 19.7	14 22.3
4	17 3.1	13 46.5	15 52.3	14 10.9	14 37.1	14 22.7	13 18.0	14 22.1
6	17 1.7	13 47.1	15 50.8	14 11.3	14 35.5	14 22.8	13 16.3	14 22.0
8	17 0.2	13 47.7	15 49.2	14 11.7	14 33.9	14 22.9	13 14.6	14 21.8
10	16 58.8	13 48.4	15 47.7	14 12.0	14 32.3	14 23.0	13 13.0	14 21.7
12	16 57.4	13 49.0	15 46.2	14 12.4	14 30.7	14 23.1	13 11.3	14 21.5
14	16 55.9	13 49.6	15 44.7	14 12.8	14 29.1	14 23.2	13 9.6	14 21.4
16	16 54.5	13 50.2	15 43.1	14 13.1	14 27.4	14 23.3	13 7.9	14 21.2
18	16 53.1	13 50.8	15 41.6	14 13.4	14 25.8	14 23.4	13 6.2	14 21.0
20	16 51.6	13 51.4	15 40.1	14 13.8	14 24.2	14 23.4	13 4.5	14 20.9
22	16 50.2	13 52.0	15 38.5	14 14.1	14 22.6	14 23.5	13 2.8	14 20.7
H. D.	0.7	0.3	0.8	0.2	0.8	0.0	0.8	0.1
	Tuesday 3.		Saturday 7.		Wednesday 11.		Sunday 15.	
0	−16 48.7	−13 52.6	−15 37.0	−14 14.4	−14 21.0	−14 23.6	−13 1.1	−14 20.5
2	16 47.3	13 53.2	15 35.4	14 14.8	14 19.3	14 23.6	12 59.4	14 20.3
4	16 45.8	13 53.8	15 33.9	14 15.1	14 17.7	14 23.7	12 57.7	14 20.1
6	16 44.4	13 54.4	15 32.3	14 15.4	14 16.1	14 23.7	12 56.0	14 19.9
8	16 42.9	13 55.0	15 30.8	14 15.7	14 14.4	14 23.8	12 54.3	14 19.7
10	16 41.5	13 55.5	15 29.2	14 16.0	14 12.8	14 23.8	12 52.6	14 19.5
12	16 40.0	13 56.1	15 27.7	14 16.3	14 11.2	14 23.8	12 50.9	14 19.3
14	16 38.5	13 56.6	15 26.1	14 16.5	14 9.5	14 23.9	12 49.1	14 19.1
16	16 37.1	13 57.2	15 24.6	14 16.8	14 7.9	14 23.9	12 47.4	14 18.9
18	16 35.6	13 57.7	15 23.0	14 17.1	14 6.2	14 23.9	12 45.7	14 18.6
20	16 34.2	13 58.3	15 21.5	14 17.4	14 4.6	14 23.9	12 44.0	14 18.4
22	16 32.7	13 58.8	15 19.9	14 17.6	14 3.0	14 23.9	12 42.3	14 18.2
H. D.	0.7	0.3	0.8	0.1	0.8	0.0	0.9	0.1
	Wednesday 4.		Sunday 8.		Thursday 12.		Monday 16.	
0	−16 31.2	−13 59.3	−15 18.4	−14 17.9	−14 1.3	−14 23.9	−12 40.6	−14 17.9
2	16 29.7	13 59.8	15 16.8	14 18.1	13 59.7	14 23.9	12 38.9	14 17.7
4	16 28.3	14 0.3	15 15.2	14 18.4	13 58.0	14 23.9	12 37.1	14 17.4
6	16 26.8	14 0.8	15 13.7	14 18.6	13 56.4	14 23.9	12 35.4	14 17.1
8	16 25.3	14 1.3	15 12.1	14 18.9	13 54.7	14 23.9	12 33.7	14 16.9
10	16 23.8	14 1.8	15 10.5	14 19.1	13 53.1	14 23.8	12 32.0	14 16.6
12	16 22.3	14 2.3	15 8.9	14 19.3	13 51.4	14 23.8	12 30.2	14 16.3
14	16 20.9	14 2.8	15 7.4	14 19.5	13 49.8	14 23.8	12 28.5	14 16.1
16	16 19.4	14 3.3	15 5.8	14 19.8	13 48.1	14 23.7	12 26.8	14 15.8
18	16 17.9	14 3.8	15 4.2	14 20.0	13 46.5	14 23.7	12 25.0	14 15.5
20	16 16.4	14 4.2	15 2.6	14 20.2	13 44.8	14 23.6	12 23.3	14 15.2
22	−16 14.9	−14 4.7	−15 1.1	−14 20.4	−13 43.1	−14 23.6	−12 21.6	−14 14.9
H. D.	0.7	0.2	0.8	0.1	0.8	0.0	0.9	0.1

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Tuesday 17.		Saturday 21.		Wednesday 25.		Sunday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−12 19.9	−14 14.6	−10 55.1	−13 54.4	−9 27.6	−13 23.6	−7 57.9	−12 43.0
2	12 18.1	14 14.3	10 53.3	13 53.9	9 25.8	13 22.8	7 56.0	12 42.0
4	12 16.4	14 14.0	10 51.5	13 53.3	9 23.9	13 22.1	7 54.1	12 41.1
6	12 14.6	14 13.7	10 49.7	13 52.8	9 22.1	13 21.3	7 52.2	12 40.1
8	12 12.9	14 13.3	10 47.9	13 52.2	9 20.2	13 20.6	7 50.3	12 39.2
10	12 11.2	14 13.0	10 46.1	13 51.7	9 18.4	13 19.8	7 48.4	12 38.2
12	12 9.4	14 12.7	10 44.3	13 51.1	9 16.5	13 19.0	7 46.6	12 37.2
14	12 7.7	14 12.3	10 42.5	13 50.6	9 14.7	13 18.3	7 44.7	12 36.3
16	12 5.9	14 12.0	10 40.7	13 50.0	9 12.8	13 17.5	7 42.8	12 35.3
18	12 4.2	14 11.7	10 38.9	13 49.4	9 11.0	13 16.7	7 40.9	12 34.3
20	12 2.4	14 11.3	10 37.1	13 48 8	9 9.1	13 15.9	7 39.0	12 33.3
22	12 0.7	14 11.0	10 35.3	13 48.3	9 7.2	13 15.1	−7 37.1	−12 32.4
H. D.	0.9	0.2	0.9	0.3	0.9	0.4	0.9	0.5
	Wednesday 18.		Sunday 22.		Thursday 26.			
0	−11 58.9	−14 10.6	−10 33.5	−13 47.7	−9 5.4	−13 14.3		
2	11 57.2	14 10.2	10 31.6	13 47.1	9 3.5	13 13.5		
4	11 55.4	14 9.9	10 29.8	13 46.5	9 1.7	13 12.7		
6	11 53.7	14 9.5	10 28.0	13 45.9	8 59.8	13 11.9		
8	11 51.9	14 9.1	10 26.2	13 45.3	8 57.9	13 11.1		
10	11 50.2	14 8.7	10 24.4	13 44.7	8 56.1	13 10.3		
12	11 48.4	14 8.3	10 22.6	13 44.1	8 54.2	13 9.4		
14	11 46.7	14 7.9	10 20.8	13 43.4	8 52.3	13 8.6		
16	11 44.9	14 7.5	10 18.9	13 42.8	8 50.5	13 7.8		
18	11 43.1	14 7.1	10 17.1	13 42.2	8 48.6	13 7.0		
20	11 41.4	14 6.7	10 15.3	13 41.6	8 46.7	13 6.1		
22	11 39.6	14 6.3	10 13.5	13 40.9	8 44.9	13 5.3		
H. D.	0.9	0.2	0.9	0.3	0.9	0.4		
	Thursday 19.		Monday 23.		Friday 27.			
0	−11 37.8	−14 5.9	−10 11.7	−13 40.3	−8 43.0	−13 4.4		
2	11 36.1	14 5.5	10 9.8	13 39.6	8 41.1	13 3.6		
4	11 34.3	14 5.0	10 8.0	13 39.0	8 39.3	13 2.7		
6	11 32.5	14 4.6	10 6.2	13 38.3	8 37.4	13 1.9		
8	11 30.8	14 4.2	10 4.4	13 37.7	8 35.5	13 1.0		
10	11 29.0	14 3.7	10 2.5	13 37.0	8 33.7	13 0.1		
12	11 27.2	14 3.3	10 0.7	13 36.3	8 31.8	12 59.3		
14	11 25.4	14 2.8	9 58.9	13 35.7	8 29.9	12 58.4		
16	11 23.7	14 2.4	9 57.0	13 35.0	8 28.0	12 57.5		
18	11 21.9	14 1.9	9 55.2	13 34.3	8 26.2	12 56.6		
20	11 20.1	14 1.4	9 53.4	13 33.6	8 24.3	12 55.8		
22	11 18.3	14 1.0	9 51.5	13 32.9	8 22.4	12 54.9		
H. D.	0.9	0.2	0.9	0.3	0.9	0.4		
	Friday 20.		Tuesday 24.		Saturday 28.			
0	−11 16.6	−14 0.5	− 9 49.7	−13 32.3	−8 20.5	−12 54.0		
2	11 14.8	14 0.0	9 47.9	13 31.6	8 18.6	12 53.1		
4	11 13.0	13 59.5	9 46.0	13 30.9	8 16.8	12 52.2		
6	11 11.2	13 59.0	9 44.2	13 30.1	8 14.9	12 51.3		
8	11 9.4	13 58.5	9 42.4	13 29.4	8 13.0	12 50.4		
10	11 7.6	13 58.0	9 40.5	13 28.7	8 11.1	12 49.5		
12	11 5.8	13 57.5	9 38.7	13 28.0	8 9.2	12 48.5		
14	11 4.1	13 57.0	9 36.8	13 27.3	8 7.3	12 47.6		
16	11 2.3	13 56.5	9 35.0	13 26.5	8 5.5	12 46.7		
18	11 0.5	13 56.0	9 33.2	13 25.8	8 3.6	12 45.8		
20	10 58.7	13 55.5	9 31.3	13 25.1	8 1.7	12 44.8		
22	−10 56.9	−13 54.9	− 9 29.5	−13 24.3	−7 59.8	−12 43.9		
H. D.	0.9	0.3	0.9	0.4	0.9	0.5		

SEMIDIAMETER.

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Feb. 1	16.26
11	16.24
21	16.20
Mar. 2	16.16

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Monday 1.		Friday 5.		Tuesday 9.		Saturday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−7 35.2	−12 31.4	−6 3.2	−11 40.1	−4 30.0	−10 41.9	−2 55.8	−9 38.2
2	7 33.3	12 30.4	6 1.3	11 39.0	4 28.0	10 40.6	2 53.8	9 36.9
4	7 31.4	12 29.4	5 59.4	11 37.8	4 26.1	10 39.4	2 51.8	9 35.5
6	7 29.5	12 28.4	5 57.5	11 36.7	4 24.1	10 38.1	2 49.9	9 34.1
8	7 27.6	12 27.4	5 55.5	11 35.5	4 22.2	10 36.8	2 47.9	9 32.7
10	7 25.7	12 26.4	5 53.6	11 34.3	4 20.2	10 35.5	2 45.9	9 31.3
12	7 23.8	12 25.4	5 51.7	11 33.2	4 18.2	10 34.2	2 43.9	9 30.0
14	7 21.9	12 24.4	5 49.7	11 32.0	4 16.3	10 32.9	2 42.0	9 28.6
16	7 20.0	12 23.4	5 47.8	11 30.9	4 14.3	10 31.6	2 40.0	9 27.2
18	7 18.1	12 22.4	5 45.8	11 29.7	4 12.4	10 30.4	2 38.0	9 25.8
20	7 16.1	12 21.3	5 43.9	11 28.5	4 10.4	10 29.1	2 36.1	9 24.4
22	7 14.2	12 20.3	5 42.0	11 27.3	4 8.5	10 27.8	2 34.1	9 23.0
H. D.	1.0	0.5	1.0	0.6	1.0	0.6	1.0	0.7
	Tuesday 2.		Saturday 6.		Wednesday 10.		Sunday 14.	
0	−7 12.3	−12 19.3	−5 40.0	−11 26.2	−4 6.5	−10 26.5	−2 32.1	−9 21.6
2	7 10.4	12 18.3	5 38.1	11 25.0	4 4.5	10 25.2	2 30.1	9 20.2
4	7 8.5	12 17.2	5 36.2	11 23.8	4 2.6	10 23.8	2 28.2	9 18.8
6	7 6.6	12 16.2	5 34.2	11 22.6	4 0.6	10 22.5	2 26.2	9 17.4
8	7 4.7	12 15.2	5 32.3	11 21.4	3 58.7	10 21.2	2 24.2	9 16.0
10	7 2.8	12 14.1	5 30.3	11 20.2	3 56.7	10 19.9	2 22.2	9 14.6
12	7 0.9	12 13.1	5 28.4	11 19.0	3 54.7	10 18.6	2 20.3	9 13.2
14	6 59.0	12 12.0	5 26.5	11 17.8	3 52.8	10 17.3	2 18.3	9 11.8
16	6 57.0	12 11.0	5 24.5	11 16.6	3 50.8	10 16.0	2 16.3	9 10.4
18	6 55.1	12 9.9	5 22.6	11 15.4	3 48.9	10 14.6	2 14.4	9 9.0
20	6 53.2	12 8.8	5 20.6	11 14.2	3 46.9	10 13.3	2 12.4	9 7.6
22	6 51.3	12 7.8	5 18.7	11 13.0	3 44.9	10 12.0	2 10.4	9 6.2
H. D.	1.0	0.5	1.0	0.6	1.0	0.7	1.0	0.7
	Wednesday 3.		Sunday 7.		Thursday 11.		Monday 15.	
0	−6 49.4	−12 6.7	−5 16.7	−11 11.8	−3 43.0	−10 10.7	−2 8.4	−9 4.8
2	6 47.5	12 5.6	5 14.8	11 10.6	3 41.0	10 9.3	2 6.5	9 3.3
4	6 45.6	12 4.6	5 12.9	11 9.4	3 39.0	10 8.0	2 4.5	9 1.9
6	6 43.6	12 3.5	5 10.9	11 8.1	3 37.1	10 6.7	2 2.5	9 0.5
8	6 41.7	12 2.4	5 9.0	11 6.9	3 35.1	10 5.4	2 0.5	8 59.1
10	6 39.8	12 1.3	5 7.0	11 5.7	3 33.1	10 4.0	1 58.6	8 57.7
12	6 37.9	12 0.2	5 5.1	11 4.5	3 31.2	10 2.7	1 56.6	8 56.2
14	6 36.0	11 59.1	5 3.1	11 3.2	3 29.2	10 1.3	1 54.6	8 54.8
16	6 34.1	11 58.0	5 1.2	11 2.0	3 27.3	10 0.0	1 52.6	8 53.4
18	6 32.1	11 56.9	4 59.2	11 0.8	3 25.3	9 58.6	1 50.7	8 52.0
20	6 30.2	11 55.8	4 57.3	10 59.5	3 23.3	9 57.3	1 48.7	8 50.5
22	6 28.3	11 54.7	4 55.3	10 58.3	3 21.4	9 55.9	1 46.7	8 49.1
H. D.	1.0	0.5	1.0	0.6	1.0	0.7	1.0	0.7
	Thursday 4.		Monday 8.		Friday 12.		Tuesday 16.	
0	−6 26.4	−11 53.6	−4 53.4	−10 57.0	−3 19.4	− 9 54.6	−1 44.7	−8 47.7
2	6 24.4	11 52.5	4 51.4	10 55.8	3 17.4	9 53.2	1 42.8	8 46.2
4	6 22.5	11 51.4	4 49.5	10 54.5	3 15.4	9 51.9	1 40.8	8 44.8
6	6 20.6	11 50.3	4 47.5	10 53.3	3 13.5	9 50.5	1 38.8	8 43.4
8	6 18.7	11 49.2	4 45.6	10 52.0	3 11.5	9 49.2	1 36.8	8 41.9
10	6 16.7	11 48.1	4 43.6	10 50.8	3 9.5	9 47.8	1 34.9	8 40.5
12	6 14.8	11 46.9	4 41.7	10 49.5	3 7.6	9 46.4	1 32.9	8 39.1
14	6 12.9	11 45.8	4 39.7	10 48.3	3 5.6	9 45.1	1 30.9	8 37.6
16	6 11.0	11 44.7	4 37.8	10 47.0	3 3.6	9 43.7	1 28.9	8 36.2
18	6 9.0	11 43.5	4 35.8	10 45.7	3 1.7	9 42.3	1 27.0	8 34.7
20	6 7.1	11 42.4	4 33.9	10 44.5	2 59.7	9 41.0	1 25.0	8 33.3
22	−6 5.2	−11 41.3	−4 31.9	−10 43.2	−2 57.7	− 9 39.6	−1 23.0	−8 31.8
H. D.	1.0	0.6	1.0	0.6	1.0	0.7	1.0	0.7

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Wednesday 17.		Sunday 21.		Thursday 25.		Monday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−1 21.0	−8 30.4	+0 13.8	−7 19.6	+1 48.4	−6 7.0	+3 22.3	−4 53.6
2	1 19.0	8 28.9	0 15.8	7 18.1	1 50.4	6 5.5	3 24.3	4 52.1
4	1 17.1	8 27.5	0 17.8	7 16.6	1 52.4	6 3.9	3 26.2	4 50.5
6	1 15.1	8 26.0	0 19.8	7 15.1	1 54.3	6 2.4	3 28.2	4 49.0
8	1 13.1	8 24.6	0 21.7	7 13.6	1 56.3	6 0.9	3 30.1	4 47.5
10	1 11.1	8 23.1	0 23.7	7 12.1	1 58.2	5 59.4	3 32.1	4 46.0
12	1 9.2	8 21.7	0 25.7	7 10.6	2 0.2	5 57.8	3 34.0	4 44.4
14	1 7.2	8 20.2	0 27.7	7 9.1	2 2.2	5 56.3	3 35.9	4 42.9
16	1 5.2	8 18.8	0 29.6	7 7.6	2 4.1	5 54.8	3 37.9	4 41.4
18	1 3.2	8 17.3	0 31.6	7 6.1	2 6.1	5 53.3	3 39.8	4 39.8
20	1 1.3	8 15.9	0 33.6	7 4.6	2 8.1	5 51.7	3 41.8	4 38.3
22	0 59.3	8 14.4	0 35.6	7 3.1	2 10.0	5 50.2	3 43.7	4 36.8
H. D.	1.0	0.7	1.0	0.8	1.0	0.8	1.0	0.8
	Thursday 18.		Monday 22.		Friday 26.		Tuesday 30.	
0	−0 57.3	−8 12.9	+0 37.5	−7 1.6	+2 12.0	−5 48.7	+3 45.7	−4 35.3
2	0 55.3	8 11.5	0 39.5	7 0.1	2 13.9	5 47.1	3 47.6	4 33.8
4	0 53.4	8 10.0	0 41.5	6 58.6	2 15.9	5 45.6	3 49.5	4 32.2
6	0 51.4	8 8.6	0 43.4	6 57.1	2 17.9	5 44.1	3 51.5	4 30.7
8	0 49.4	8 7.1	0 45.4	6 55.6	2 19.8	5 42.6	3 53.4	4 29.2
10	0 47.4	8 5.6	0 47.4	6 54.1	2 21.8	5 41.0	3 55.4	4 27.7
12	0 45.4	8 4.1	0 49.4	6 52.5	2 23.7	5 39.5	3 57.3	4 26.1
14	0 43.5	8 2.7	0 51.3	6 51.0	2 25.7	5 38.0	3 59.2	4 24.6
16	0 41.5	8 1.2	0 53.3	6 49.5	2 27.7	5 36.4	4 1.2	4 23.1
18	0 39.5	7 59.7	0 55.3	6 48.0	2 29.6	5 34.9	4 3.1	4 21.6
20	0 37.5	7 58.3	0 57.3	6 46.5	2 31.6	5 33.4	4 5.0	4 20.0
22	0 35.6	7 56.8	0 59.2	6 45.0	2 33.5	5 31.8	4 7.0	4 18.5
H. D.	1.0	0.7	1.0	0.8	1.0	0.8	1.0	0.8
	Friday 19.		Tuesday 23.		Saturday 27.		Wednesday 31.	
0	−0 33.6	−7 55.3	+1 1.2	−6 43.5	+2 35.5	−5 30.3	+4 8.9	−4 17.0
2	0 31.6	7 53.8	1 3.2	6 42.0	2 37.4	5 28.8	4 10.8	4 15.5
4	0 29.6	7 52.3	1 5.1	6 40.4	2 39.4	5 27.3	4 12.8	4 14.0
6	0 27.7	7 50.9	1 7.1	6 38.9	2 41.4	5 25.7	4 14.7	4 12.4
8	0 25.7	7 49.4	1 9.1	6 37.4	2 43.3	5 24.2	4 16.6	4 10.9
10	0 23.7	7 47.9	1 11.0	6 35.9	2 45.3	5 22.7	4 18.6	4 9.4
12	0 21.7	7 46.4	1 13.0	6 34.4	2 47.2	5 21.1	4 20.5	4 7.9
14	0 19.7	7 45.0	1 15.0	6 32.9	2 49.2	5 19.6	4 22.4	4 6.4
16	0 17.8	7 43.5	1 17.0	6 31.3	2 51.1	5 18.1	4 24.4	4 4.9
18	0 15.8	7 42.0	1 18.9	6 29.8	2 53.1	5 16.5	4 26.3	4 3.4
20	0 13.8	7 40.5	1 20.9	6 28.3	2 55.0	5 15.0	4 28.2	4 1.8
22	0 11.8	7 39.0	1 22.9	6 26.8	2 57.0	5 13.5	+4 30.2	−4 0.3
H. D.	1.0	0.7	1.0	0.8	1.0	0.8	1.0	0.8
	Saturday 20.		Wednesday 24.		Sunday 28.			
0	−0 9.9	−7 37.5	+1 24.8	−6 25.3	+2 58.9	−5 12.0		
2	0 7.9	7 36.0	1 26.8	6 23.7	3 0.9	5 10.4		
4	0 5.9	7 34.6	1 28.8	6 22.2	3 2.8	5 8.9		
6	0 3.9	7 33.1	1 30.7	6 20.7	3 4.8	5 7.4		
8	−0 2.0	7 31.6	1 32.7	6 19.2	3 6.7	5 5.8		
10	0 0.0	7 30.1	1 34.7	6 17.7	3 8.7	5 4.3		
12	+0 2.0	7 28.6	1 36.6	6 16.1	3 10.6	5 2.8		
14	0 4.0	7 27.1	1 38.6	6 14.6	3 12.6	5 1.2		
16	0 5.9	7 25.6	1 40.6	6 13.1	3 14.5	4 59.7		
18	0 7.9	7 24.1	1 42.5	6 11.6	3 16.5	4 58.2		
20	0 9.9	7 22.6	1 44.5	6 10.0	3 18.4	4 56.7		
22	+0 11.9	−7 21.1	+1 46.5	−6 8.5	+3 20.4	−4 55.1		
H. D.	1.0	0.7	1.0	0.8	1.0	0.8		

SEMIDIAMETER.

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Mar. 1	16.17
11	16.13
21	16.08
31	16.03

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Thursday 1.		Monday 5.		Friday 9.		Tuesday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+4 32.1	−3 58.8	+6 3.9	−2 47.3	+7 34.1	−1 38.7	+ 9 2.3	−0 34.5
2	4 34.0	3 57.3	6 5.8	2 45.8	7 36.0	1 37.3	9 4.1	0 33.2
4	4 35.9	3 55.8	6 7.7	2 44.3	7 37.8	1 35.9	9 5.9	0 31.9
6	4 37.9	3 54.3	6 9.6	2 42.9	7 39.7	1 34.6	9 7.7	0 30.6
8	4 39.8	3 52.8	6 11.5	2 41.4	7 41.5	1 33.2	9 9.5	0 29.3
10	4 41.7	3 51.3	6 13.4	2 40.0	7 43.4	1 31.8	9 11.3	0 28.1
12	4 43.6	3 49.8	6 15.3	2 38.5	7 45.2	1 30.4	9 13.1	0 26.8
14	4 45.6	3 48.2	6 17.2	2 37.0	7 47.1	1 29.0	9 14.9	0 25.5
16	4 47.5	3 46.7	6 19.1	2 35.6	7 48.9	1 27.7	9 16.7	0 24.3
18	4 49.4	3 45.2	6 21.0	2 34.1	7 50.8	1 26.3	9 18.5	0 23.0
20	4 51.3	3 43.7	6 22.9	2 32.7	7 52.6	1 24.9	9 20.3	0 21.7
22	4 53.3	3 42.2	6 24.8	2 31.2	7 54.5	1 23.6	9 22.1	0 20.5
H. D.	1.0	0.8	0.9	0.7	0.9	0.7	0.9	0.6
	Friday 2.		Tuesday 6.		Saturday 10.		Wednesday 14.	
0	+4 55.2	−3 40.7	+6 26.6	−2 29.8	+7 56.3	−1 22.2	+ 9 23.9	−0 19.2
2	4 57.1	3 39.2	6 28.5	2 28.3	7 58.2	1 20.8	9 25.7	0 17.9
4	4 59.0	3 37.7	6 30.4	2 26.9	8 0.0	1 19.5	9 27.5	0 16.7
6	5 0.9	3 36.2	6 32.3	2 25.4	8 1.9	1 18.1	9 29.3	0 15.4
8	5 2.9	3 34.7	6 34.2	2 24.0	8 3.7	1 16.8	9 31.1	0 14.2
10	5 4.8	3 33.2	6 36.1	2 22.6	8 5.6	1 15.4	9 32.9	0 12.9
12	5 6.7	3 31.7	6 38.0	2 21.1	8 7.4	1 14.1	9 34.7	0 11.7
14	5 8.6	3 30.2	6 39.8	2 19.7	8 9.3	1 12.7	9 36.5	0 10.5
16	5 10.5	3 28.7	6 41.7	2 18.2	8 11.1	1 11.4	9 38.3	0 9.2
18	5 12.5	3 27.2	6 43.6	2 16.8	8 12.9	1 10.0	9 40.1	0 8.0
20	5 14.4	3 25.7	6 45.5	2 15.4	8 14.8	1 8.7	9 41.9	0 6.8
22	5 16.3	3 24.2	6 47.4	2 14.0	8 16.6	1 7.3	9 43.7	0 5.5
H. D.	1.0	0.7	0.9	0.7	0.9	0.7	0.9	0.6
	Saturday 3.		Wednesday 7.		Sunday 11.		Thursday 15.	
0	+5 18.2	−3 22.7	+6 49.2	−2 12.5	+8 18.5	−1 6.0	+ 9 45.5	−0 4.3
2	5 20.1	3 21.3	6 51.1	2 11.1	8 20.3	1 4.6	9 47.2	0 3.1
4	5 22.0	3 19.8	6 53.0	2 9.7	8 22.1	1 3.3	9 49.0	0 1.9
6	5 23.9	3 18.3	6 54.9	2 8.2	8 24.0	1 2.0	9 50.8	−0 0.6
8	5 25.8	3 16.8	6 56.8	2 6.8	8 25.8	1 0.6	9 52.6	+0 0.6
10	5 27.8	3 15.3	6 58.6	2 5.4	8 27.6	0 59.3	9 54.4	0 1.8
12	5 29.7	3 13.8	7 0.5	2 4.0	8 29.5	0 58.0	9 56.2	0 3.0
14	5 31.6	3 12.3	7 2.4	2 2.6	8 31.3	0 56.7	9 57.9	0 4.2
16	5 33.5	3 10.8	7 4.2	2 1.1	8 33.1	0 55.3	9 59.7	0 5.4
18	5 35.4	3 9.4	7 6.1	1 59.7	8 35.0	0 54.0	10 1.5	0 6.6
20	5 37.3	3 7.9	7 8.0	1 58.3	8 36.8	0 52.7	10 3.3	0 7.8
22	5 39.2	3 6.4	7 9.9	1 56.9	8 38.6	0 51.4	10 5.1	0 9.0
H. D.	1.0	0.7	0.9	0.7	0.9	0.7	0.9	0.6
	Sunday 4.		Thursday 8.		Monday 12.		Friday 16.	
0	+5 41.1	−3 4.9	+7 11.7	−1 55.5	+8 40.4	−0 50.1	+10 6.8	+0 10.2
2	5 43.0	3 3.4	7 13.6	1 54.1	8 42.3	0 48.8	10 8.6	0 11.4
4	5 44.9	3 2.0	7 15.5	1 52.7	8 44.1	0 47.4	10 10.4	0 12.6
6	5 46.8	3 0.5	7 17.3	1 51.3	8 45.9	0 46.1	10 12.1	0 13.8
8	5 48.7	2 59.0	7 19.2	1 49.9	8 47.7	0 44.8	10 13.9	0 15.0
10	5 50.6	2 57.5	7 21.1	1 48.5	8 49.5	0 43.5	10 15.7	0 16.2
12	5 52.5	2 56.1	7 22.9	1 47.1	8 51.4	0 42.2	10 17.5	0 17.4
14	5 54.4	2 54.6	7 24.8	1 45.7	8 53.2	0 40.9	10 19.2	0 18.5
16	5 56.3	2 53.1	7 26.7	1 44.3	8 55.0	0 39.6	10 21.0	0 19.7
18	5 58.2	2 51.7	7 28.5	1 42.9	8 56.8	0 38.3	10 22.7	0 20.9
20	6 0.1	2 50.2	7 30.4	1 41.5	8 58.6	0 37.0	10 24.5	0 22.1
22	+6 2.0	−2 48.7	+7 32.2	−1 40.1	+9 0.4	−0 35.8	+10 26.3	+0 23.2
H. D.	1.0	0.7	0.9	0.7	0.9	0.6	0.9	0.6

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Saturday 17.		Wednesday 21.		Sunday 25.		Thursday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+10 28.0	+0 24.4	+11 51.0	+1 17.1	+13 10.9	+2 2.9	+14 27.3	+2 41.4
2	10 29.8	0 25.6	11 52.7	1 18.1	13 12.6	2 3.8	14 28.9	2 42.1
4	10 31.5	0 26.7	11 54.4	1 19.1	13 14.2	2 4.7	14 30.4	2 42.8
6	10 33.3	0 27.9	11 56.1	1 20.1	13 15.8	2 5.6	14 32.0	2 43.6
8	10 35.1	0 29.0	11 57.8	1 21.2	13 17.4	2 6.4	14 33.5	2 44.3
10	10 36.8	0 30.2	11 59.5	1 22.2	13 19.1	2 7.3	14 35.1	2 45.0
12	10 38.6	0 31.3	12 1.2	1 23.2	13 20.7	2 8.2	14 36.6	2 45.7
14	10 40.3	0 32.5	12 2.9	1 24.2	13 22.3	2 9.0	14 38.2	2 46.4
16	10 42.1	0 33.6	12 4.6	1 25.2	13 23.9	2 9.9	14 39.7	2 47.1
18	10 43.8	0 34.8	12 6.3	1 26.2	13 25.5	2 10.7	14 41.2	2 47.7
20	10 45.6	0 35.9	12 8.0	1 27.2	13 27.2	2 11.6	14 42.8	2 48.4
22	10 47.3	0 37.0	12 9.6	1 28.2	13 28.8	2 12.4	14 44.3	2 49.1
H. D.	0.9	0.6	0.8	0.5	0.8	0.4	0.8	0.3
	Sunday 18.		Thursday 22.		Monday 26.		Friday 30.	
0	+10 49.1	+0 38.2	+12 11.3	+1 29.2	+13 30.4	+2 13.3	+14 45.9	+2 49.8
2	10 50.8	0 39.3	12 13.0	1 30.2	13 32.0	2 14.1	14 47.4	2 50.5
4	10 52.5	0 40.4	12 14.7	1 31.2	13 33.6	2 15.0	14 48.9	2 51.1
6	10 54.3	0 41.6	12 16.4	1 32.2	13 35.2	2 15.8	14 50.4	2 51.8
8	10 56.0	0 42.7	12 18.0	1 33.1	13 36.8	2 16.6	14 52.0	2 52.5
10	10 57.8	0 43.8	12 19.7	1 34.1	13 38.4	2 17.5	14 53.5	2 53.1
12	10 59.5	0 44.9	12 21.4	1 35.1	13 40.0	2 18.3	14 55.0	2 53.8
14	11 1.2	0 46.0	12 23.1	1 36.1	13 41.6	2 19.1	14 56.5	2 54.4
16	11 3.0	0 47.1	12 24.7	1 37.0	13 43.2	2 19.9	14 58.1	2 55.1
18	11 4.7	0 48.2	12 26.4	1 38.0	13 44.8	2 20.7	14 59.6	2 55.7
20	11 6.4	0 49.3	12 28.1	1 39.0	13 46.4	2 21.5	15 1.1	2 56.4
22	11 8.2	0 50.4	12 29.7	1 39.9	13 48.0	2 22.3	+15 2.6	+2 57.0
H. D.	0.9	0.6	0.8	0.5	0.8	0.4	0.8	0.3
	Monday 19.		Friday 23.		Tuesday 27.			
0	+11 9.9	+0 51.5	+12 31.4	+1 40.9	+13 49.6	+2 23.1		
2	11 11.6	0 52.6	12 33.1	1 41.8	13 51.2	2 23.9		
4	11 13.4	0 53.7	12 34.7	1 42.8	13 52.8	2 24.7		
6	11 15.1	0 54.8	12 36.4	1 43.7	13 54.4	2 25.5		
8	11 16.8	0 55.9	12 38.0	1 44.7	13 55.9	2 26.3		
10	11 18.5	0 57.0	12 39.7	1 45.6	13 57.5	2 27.1		
12	11 20.3	0 58.1	12 41.4	1 46.6	13 59.1	2 27.9		
14	11 22.0	0 59.2	12 43.0	1 47.5	14 0.7	2 28.7		
16	11 23.7	1 0.2	12 44.7	1 48.4	14 2.3	2 29.5		
18	11 25.4	1 1.3	12 46.3	1 49.4	14 3.8	2 30.2		
20	11 27.1	1 2.4	12 48.0	1 50.3	14 5.4	2 31.0	SEMIDIAMETER.	
22	11 28.9	1 3.5	12 49.6	1 51.2	14 7.0	2 31.8		
H. D.	0.9	0.5	0.8	0.5	0.8	0.4		
	Tuesday 20.		Saturday 24.		Wednesday 28.			′
0	+11 30.6	+1 4.5	+12 51.3	+1 52.1	+14 8.6	+2 32.5	Apr. 1	16.03
2	11 32.3	1 5.6	12 52.9	1 53.1	14 10.1	2 33.3	11	15.98
4	11 34.0	1 6.6	12 54.6	1 54.0	14 11.7	2 34.0	21	15.94
6	11 35.7	1 7.7	12 56.2	1 54.9	14 13.3	2 34.8	May 1	15.90
8	11 37.4	1 8.7	12 57.9	1 55.8	14 14.9	2 35.5		
10	11 39.1	1 9.8	12 59.5	1 56.7	14 16.4	2 36.3		
12	11 40.8	1 10.8	13 1.1	1 57.6	14 18.0	2 37.0		
14	11 42.5	1 11.9	13 2.8	1 58.5	14 19.5	2 37.8		
16	11 44.2	1 12.9	13 4.4	1 59.4	14 21.1	2 38.5		
18	11 45.9	1 14.0	13 6.0	2 0.3	14 22.7	2 39.2		
20	11 47.6	1 15.0	13 7.7	2 1.2	14 24.2	2 40.0		
22	+11 49.3	+1 16.0	+13 9.3	+2 2.1	+14 25.8	+2 40.7		
H. D.	0.9	0.5	0.8	0.4	0.8	0.4		

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Saturday 1.		Wednesday 5.		Sunday 9.		Thursday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+15 4.1	+2 57.6	+16 14.7	+3 23.6	+17 21.0	+3 40.6	+18 22.6	+3 48.1
2	15 5.6	2 58.3	16 16.1	3 24.1	17 22.3	3 40.8	18 23.8	3 48.1
4	15 7.1	2 58.9	16 17.5	3 24.5	17 23.6	3 41.1	18 25.1	3 48.2
6	15 8.7	2 59.5	16 19.0	3 25.0	17 24.9	3 41.3	18 26.3	3 48.2
8	15 10.2	3 0.1	16 20.4	3 25.4	17 26.3	3 41.6	18 27.5	3 48.3
10	15 11.7	3 0.8	16 21.8	3 25.8	17 27.6	3 41.8	18 28.7	3 48.3
12	15 13.2	3 1.4	16 23.2	3 26.3	17 28.9	3 42.0	18 30.0	3 48.4
14	15 14.7	3 2.0	16 24.6	3 26.7	17 30.2	3 42.3	18 31.2	3 48.4
16	15 16.2	3 2.6	16 26.0	3 27.1	17 31.6	3 42.5	18 32.4	3 48.4
18	15 17.7	3 3.2	16 27.4	3 27.5	17 32.9	3 42.7	18 33.6	3 48.4
20	15 19.2	3 3.8	16 28.9	3 27.9	17 34.2	3 42.9	18 34.8	3 48.5
22	15 20.7	3 4.4	16 30.3	3 28.3	17 35.5	3 43.1	18 36.0	3 48.5
H. D.	0.8	0.3	0.7	0.2	0.7	0.1	0.6	0.0
	Sunday 2.		Thursday 6.		Monday 10.		Friday 14.	
0	+15 22.2	+3 5.0	+16 31.7	+3 28.7	+17 36.8	+3 43.3	+18 37.2	+3 48.5
2	15 23.6	3 5.5	16 33.1	3 29.1	17 38.1	3 43.5	18 38.5	3 48.5
4	15 25.1	3 6.1	16 34.5	3 29.5	17 39.4	3 43.7	18 39.7	3 48.5
6	15 26.6	3 6.7	16 35.9	3 29.9	17 40.7	3 43.9	18 40.9	3 48.5
8	15 28.1	3 7.3	16 37.3	3 30.3	17 42.0	3 44.1	18 42.1	3 48.5
10	15 29.6	3 7.8	16 38.7	3 30.7	17 43.3	3 44.3	18 43.3	3 48.5
12	15 31.1	3 8.4	16 40.1	3 31.1	17 44.6	3 44.5	18 44.5	3 48.5
14	15 32.6	3 9.0	16 41.4	3 31.5	17 45.9	3 44.7	18 45.6	3 48.5
16	15 34.0	3 9.5	16 42.8	3 31.8	17 47.2	3 44.9	18 46.8	3 48.4
18	15 35.5	3 10.1	16 44.2	3 32.2	17 48.5	3 45.0	18 48.0	3 48.4
20	15 37.0	3 10.6	16 45.6	3 32.6	17 49.8	3 45.2	18 49.2	3 48.4
22	15 38.5	3 11.2	16 47.0	3 32.9	17 51.1	3 45.4	18 50.4	3 48.3
H. D.	0.7	0.3	0.7	0.2	0.6	0.1	0.6	0.0
	Monday 3.		Friday 7.		Tuesday 11.		Saturday 15.	
0	+15 39.9	+3 11.7	+16 48.4	+3 33.3	+17 52.4	+3 45.5	+18 51.6	+3 48.3
2	15 41.4	3 12.3	16 49.8	3 33.6	17 53.7	3 45.7	18 52.8	3 48.3
4	15 42.9	3 12.8	16 51.1	3 34.0	17 54.9	3 45.8	18 53.9	3 48.2
6	15 44.3	3 13.3	16 52.5	3 34.3	17 56.2	3 46.0	18 55.1	3 48.2
8	15 45.8	3 13.9	16 53.9	3 34.7	17 57.5	3 46.1	18 56.3	3 48.1
10	15 47.3	3 14.4	16 55.3	3 35.0	17 58.8	3 46.3	18 57.5	3 48.1
12	15 48.7	3 14.9	16 56.6	3 35.3	18 0.0	3 46.4	18 58.6	3 48.0
14	15 50.2	3 15.4	16 58.0	3 35.6	18 1.3	3 46.5	18 59.8	3 47.9
16	15 51.6	3 16.0	16 59.4	3 36.0	18 2.6	3 46.6	19 1.0	3 47.9
18	15 53.1	3 16.5	17 0.7	3 36.3	18 3.9	3 46.8	19 2.1	3 47.8
20	15 54.5	3 17.0	17 2.1	3 36.6	18 5.1	3 46.9	19 3.3	3 47.7
22	15 56.0	3 17.5	17 3.4	3 36.9	18 6.4	3 47.0	19 4.4	3 47.6
H. D.	0.7	0.3	0.7	0.2	0.6	0.1	0.6	0.0
	Tuesday 4.		Saturday 8.		Wednesday 12.		Sunday 16.	
0	+15 57.4	+3 18.0	+17 4.8	+3 37.2	+18 7.6	+3 47.1	+19 5.6	+3 47.5
2	15 58.9	3 18.5	17 6.2	3 37.5	18 8.9	3 47.2	19 6.8	3 47.4
4	16 0.3	3 18.9	17 7.5	3 37.8	18 10.2	3 47.3	19 7.9	3 47.4
6	16 1.8	3 19.4	17 8.9	3 38.1	18 11.4	3 47.4	19 9.1	3 47.3
8	16 3.2	3 19.9	17 10.2	3 38.4	18 12.7	3 47.5	19 10.2	3 47.2
10	16 4.7	3 20.4	17 11.6	3 38.7	18 13.9	3 47.6	19 11.4	3 47.0
12	16 6.1	3 20.9	17 12.9	3 39.0	18 15.2	3 47.7	19 12.5	3 46.9
14	16 7.5	3 21.3	17 14.3	3 39.2	18 16.4	3 47.8	19 13.6	3 46.8
16	16 9.0	3 21.8	17 15.6	3 39.5	18 17.6	3 47.8	19 14.8	3 46.7
18	16 10.4	3 22.3	17 16.9	3 39.8	18 18.9	3 47.9	19 15.9	3 46.6
20	16 11.8	3 22.7	17 18.3	3 40.1	18 20.1	3 48.0	19 17.0	3 46.5
22	+16 13.3	+3 23.2	+17 19.6	+3 40.3	+18 21.4	+3 48.0	+19 18.2	+3 46.3
H. D.	0.7	0.2	0.7	0.1	0.6	0.0	0.6	0.1

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Monday 17.		Friday 21.		Tuesday 25.		Saturday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+19 19.3	+3 46.2	+20 10.8	+3 35.3	+20 56.7	+3 16.0	+21 36.9	+2 49.1
2	19 20.4	3 46.0	20 11.8	3 34.9	20 57.6	3 15.5	21 37.7	2 48.5
4	19 21.6	3 45.9	20 12.8	3 34.6	20 58.5	3 15.0	21 38.5	2 47.9
6	19 22.7	3 45.8	20 13.8	3 34.3	20 59.4	3 14.5	21 39.2	2 47.2
8	19 23.8	3 45.6	20 14.8	3 34.0	21 0.3	3 14.1	21 40.0	2 46.6
10	19 24.9	3 45.5	20 15.8	3 33.6	21 1.2	3 13.6	21 40.8	2 45.9
12	19 26.0	3 45.3	20 16.8	3 33.3	21 2.1	3 13.1	21 41.5	2 45.3
14	19 27.1	3 45.1	20 17.8	3 33.0	21 3.0	3 12.6	21 42.3	2 44.6
16	19 28.3	3 45.0	20 18.8	3 32.6	21 3.8	3 12.0	21 43.1	2 44.0
18	19 29.4	3 44.8	20 19.8	3 32.3	21 4.7	3 11.5	21 43.8	2 43.3
20	19 30.5	3 44.6	20 20.8	3 31.9	21 5.6	3 11.0	21 44.6	2 42.6
22	19 31.6	3 44.5	20 21.8	3 31.6	21 6.5	3 10.5	21 45.3	2 42.0
H. D.	0.6	0.1	0.5	0.2	0.4	0.3	0.4	0.3
	Tuesday 18.		Saturday 22.		Wednesday 26.		Sunday 30.	
0	+19 32.7	+3 44.3	+20 22.8	+3 31.2	+21 7.3	+3 10.0	+21 46.1	+2 41.3
2	19 33.8	3 44.1	20 23.8	3 30.8	21 8.2	3 9.5	21 46.8	2 40.6
4	19 34.9	3 43.9	20 24.8	3 30.5	21 9.1	3 8.9	21 47.5	2 40.0
6	19 36.0	3 43.7	20 25.7	3 30.1	21 9.9	3 8.4	21 48.3	2 39.3
8	19 37.1	3 43.5	20 26.7	3 29.7	21 10.8	3 7.9	21 49.0	2 38.6
10	19 38.1	3 43.3	20 27.7	3 29.4	21 11.6	3 7.3	21 49.7	2 37.9
12	19 39.2	3 43.1	20 28.7	3 29.0	21 12.5	3 6.8	21 50.5	2 37.2
14	19 40.3	3 42.9	20 29.6	3 28.6	21 13.4	3 6.3	21 51.2	2 36.5
16	19 41.4	3 42.7	20 30.6	3 28.2	21 14.2	3 5.7	21 51.9	2 35.8
18	19 42.5	3 42.5	20 31.6	3 27.8	21 15.1	3 5.2	21 52.6	2 35.1
20	19 43.6	3 42.3	20 32.5	3 27.4	21 15.9	3 4.6	21 53.4	2 34.4
22	19 44.6	3 42.0	20 33.5	3 27.0	21 16.7	3 4.1	21 54.1	2 33.7
H. D.	0.5	0.1	0.5	0.2	0.4	0.3	0.4	0.3
	Wednesday 19.		Sunday 23.		Thursday 27.		Monday 31.	
0	+19 45.7	+3 41.8	+20 34.5	+3 26.6	+21 17.6	+3 3.5	+21 54.8	+2 33.0
2	19 46.8	3 41.6	20 35.4	3 26.2	21 18.4	3 2.9	21 55.5	2 32.3
4	19 47.9	3 41.4	20 36.4	3 25.8	21 19.2	3 2.4	21 56.2	2 31.6
6	19 48.9	3 41.1	20 37.3	3 25.4	21 20.1	3 1.8	21 56.9	2 30.9
8	19 50.0	3 40.9	20 38.3	3 25.0	21 20.9	3 1.2	21 57.6	2 30.2
10	19 51.0	3 40.6	20 39.2	3 24.6	21 21.7	3 0.7	21 58.3	2 29.5
12	19 52.1	3 40.4	20 40.2	3 24.2	21 22.5	3 0.1	21 59.0	2 28.8
14	19 53.2	3 40.1	20 41.1	3 23.7	21 23.4	2 59.5	21 59.7	2 28.0
16	19 54.2	3 39.9	20 42.0	3 23.3	21 24.2	2 58.9	22 0.4	2 27.3
18	19 55.3	3 39.6	20 43.0	3 22.9	21 25.0	2 58.3	22 1.1	2 26.6
20	19 56.3	3 39.3	20 43.9	3 22.4	21 25.8	2 57.7	22 1.8	2 25.8
22	19 57.4	3 39.1	20 44.9	3 22.0	21 26.6	2 57.1	+22 2.5	+2 25.1
H. D.	0.5	0.1	0.5	0.2	0.4	0.3	0.3	0.4
	Thursday 20.		Monday 24.		Friday 28.			
0	+19 58.4	+3 38.8	+20 45.8	+3 21.6	+21 27.4	+2 56.5		
2	19 59.5	3 38.5	20 46.7	3 21.1	21 28.2	2 55.9		
4	20 0.5	3 38.3	20 47.6	3 20.7	21 29.0	2 55.3		
6	20 1.5	3 38.0	20 48.6	3 20.2	21 29.8	2 54.7		
8	20 2.6	3 37.7	20 49.5	3 19.8	21 30.6	2 54.1		
10	20 3.6	3 37.4	20 50.4	3 19.3	21 31.4	2 53.5		
12	20 4.6	3 37.1	20 51.3	3 18.8	21 32.2	2 52.9		
14	20 5.7	3 36.8	20 52.2	3 18.4	21 33.0	2 52.3		
16	20 6.7	3 36.5	20 53.1	3 17.9	21 33.8	2 51.6		
18	20 7.7	3 36.2	20 54.0	3 17.4	21 34.6	2 51.0		
20	20 8.7	3 35.9	20 54.9	3 17.0	21 35.4	2 50.4		
22	+20 9.8	+3 35.6	+20 55.8	+3 16.5	+21 36.2	+2 49.8		
H. D.	0.5	0.1	0.5	0.2	0.4	0.3		

SEMIDIAMETER.

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May 1	15.90
11	15.86
21	15.83
31	15.80

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Tuesday 1.		Saturday 5.		Wednesday 9.		Sunday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+22 3.2	+2 24.4	+22 32.7	+1 45.8	+22 56.0	+1 1.8	+23 12.8	+0 13.4
2	22 3.8	2 23.6	22 33.3	1 44.9	22 56.4	1 0.8	23 13.1	0 12.4
4	22 4.5	2 22.9	22 33.8	1 44.1	22 56.8	0 59.8	23 13.4	0 11.3
6	22 5.2	2 22.1	22 34.4	1 43.2	22 57.3	0 58.9	23 13.7	0 10.3
8	22 5.9	2 21.4	22 34.9	1 42.3	22 57.7	0 57.9	23 13.9	0 9.2
10	22 6.5	2 20.6	22 35.5	1 41.5	22 58.1	0 56.9	23 14.2	0 8.2
12	22 7.2	2 19.9	22 36.0	1 40.6	22 58.5	0 55.9	23 14.5	0 7.1
14	22 7.9	2 19.1	22 36.5	1 39.7	22 58.9	0 55.0	23 14.7	0 6.1
16	22 8.5	2 18.4	22 37.1	1 38.8	22 59.3	0 54.0	23 15.0	0 5.0
18	22 9.2	2 17.6	22 37.6	1 37.9	22 59.7	0 53.0	23 15.3	0 4.0
20	22 9.8	2 16.8	22 38.1	1 37.1	23 0.1	0 52.0	23 15.5	0 2.9
22	22 10.5	2 16.1	22 38.6	1 36.2	23 0.4	0 51.0	23 15.8	0 1.9
H. D.	0.3	0.4	0.3	0.4	0.2	0.5	0.1	0.5
	Wednesday 2.		Sunday 6.		Thursday 10.		Monday 14.	
0	+22 11.1	+2 15.3	+22 39.2	+1 35.3	+23 0.8	+0 50.0	+23 16.0	+0 0.8
2	22 11.8	2 14.5	22 39.7	1 34.4	23 1.2	0 49.1	23 16.3	−0 0.2
4	22 12.4	2 13.7	22 40.2	1 33.5	23 1.6	0 48.1	23 16.5	0 1.3
6	22 13.1	2 13.0	22 40.7	1 32.6	23 2.0	0 47.1	23 16.8	0 2.4
8	22 13.7	2 12.2	22 41.2	1 31.7	23 2.3	0 46.1	23 17.0	0 3.4
10	22 14.3	2 11.4	22 41.7	1 30.8	23 2.7	0 45.1	23 17.2	0 4.5
12	22 15.0	2 10.6	22 42.2	1 29.9	23 3.1	0 44.1	23 17.5	0 5.5
14	22 15.6	2 9.8	22 42.7	1 29.0	23 3.5	0 43.1	23 17.7	0 6.6
16	22 16.2	2 9.0	22 43.2	1 28.1	23 3.8	0 42.1	23 17.9	0 7.7
18	22 16.9	2 8.2	22 43.7	1 27.2	23 4.2	0 41.1	23 18.2	0 8.7
20	22 17.5	2 7.4	22 44.2	1 26.2	23 4.5	0 40.1	23 18.4	0 9.8
22	22 18.1	2 6.6	22 44.7	1 25.3	23 4.9	0 39.1	23 18.6	0 10.9
H. D.	0.3	0.4	0.3	0.5	0.2	0.5	0.1	0.5
	Thursday 3.		Monday 7.		Friday 11.		Tuesday 15.	
0	+22 18.7	+2 5.8	+22 45.2	+1 24.4	+23 5.2	+0 38.1	+23 18.8	−0 11.9
2	22 19.3	2 5.0	22 45.7	1 23.5	23 5.6	0 37.1	23 19.0	0 13.0
4	22 19.9	2 4.2	22 46.1	1 22.6	23 5.9	0 36.0	23 19.2	0 14.1
6	22 20.6	2 3.4	22 46.6	1 21.7	23 6.3	0 35.0	23 19.4	0 15.1
8	22 21.2	2 2.6	22 47.1	1 20.7	23 6.6	0 34.0	23 19.6	0 16.2
10	22 21.8	2 1.8	22 47.6	1 19.8	23 7.0	0 33.0	23 19.8	0 17.3
12	22 22.4	2 1.0	22 48.0	1 18.9	23 7.3	0 32.0	23 20.0	0 18.4
14	22 23.0	2 0.1	22 48.5	1 17.9	23 7.6	0 31.0	23 20.2	0 19.4
16	22 23.6	1 59.3	22 49.0	1 17.0	23 8.0	0 29.9	23 20.4	0 20.5
18	22 24.2	1 58.5	22 49.4	1 16.1	23 8.3	0 28.9	23 20.6	0 21.6
20	22 24.8	1 57.7	22 49.9	1 15.1	23 8.6	0 27.9	23 20.8	0 22.7
22	22 25.3	1 56.8	22 50.3	1 14.2	23 8.9	0 26.9	23 21.0	0 23.7
H. D.	0.3	0.4	0.2	0.5	0.2	0.5	0.1	0.5
	Friday 4.		Tuesday 8.		Saturday 12.		Wednesday 16.	
0	+22 25.9	+1 56.0	+22 50.8	+1 13.2	+23 9.3	+0 25.8	+23 21.2	−0 24.8
2	22 26.5	1 55.2	22 51.2	1 12.3	23 9.6	0 24.8	23 21.4	0 25.9
4	22 27.1	1 54.3	22 51.7	1 11.4	23 9.9	0 23.8	23 21.5	0 27.0
6	22 27.7	1 53.5	22 52.1	1 10.4	23 10.2	0 22.8	23 21.7	0 28.0
8	22 28.2	1 52.6	22 52.6	1 9.5	23 10.5	0 21.7	23 21.9	0 29.1
10	22 28.8	1 51.8	22 53.0	1 8.5	23 10.8	0 20.7	23 22.1	0 30.2
12	22 29.4	1 51.0	22 53.5	1 7.5	23 11.1	0 19.7	23 22.2	0 31.3
14	22 29.9	1 50.1	22 53.9	1 6.6	23 11.4	0 18.6	23 22.4	0 32.4
16	22 30.5	1 49.3	22 54.3	1 5.6	23 11.7	0 17.6	23 22.5	0 33.4
18	22 31.1	1 48.4	22 54.7	1 4.7	23 12.0	0 16.5	23 22.7	0 34.5
20	22 31.6	1 47.5	22 55.2	1 3.7	23 12.3	0 15.5	23 22.8	0 35.6
22	+22 32.2	+1 46.7	+22 55.6	+1 2.8	+23 12.6	+0 14.5	+23 23.0	−0 36.7
H. D.	0.3	0.4	0.2	0.5	0.1	0.5	0.1	0.5

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Thursday 17.		Monday 21.		Friday 25.		Tuesday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+23 23.1	−0 37.8	+23 26.8	−1 30.1	+23 23.9	−2 21.7	+23 14.4	−3 11.1
2	23 23.3	0 38.9	23 26.8	1 31.1	23 23.8	2 22.7	23 14.2	3 12.1
4	23 23.4	0 39.9	23 26.8	1 32.2	23 23.7	2 23.8	23 13.9	3 13.1
6	23 23.6	0 41.0	23 26.8	1 33.3	23 23.5	2 24.8	23 13.6	3 14.1
8	23 23.7	0 42.1	23 26.8	1 34.4	23 23.4	2 25.9	23 13.4	3 15.1
10	23 23.8	0 43.2	23 26.8	1 35.5	23 23.2	2 26.9	23 13.1	3 16.1
12	23 24.0	0 44.3	23 26.8	1 36.6	23 23.1	2 28.0	23 12.8	3 17.1
14	23 24.1	0 45.4	23 26.8	1 37.7	23 23.0	2 29.0	23 12.5	3 18.1
16	23 24.2	0 46.5	23 26.8	1 38.7	23 22.8	2 30.1	23 12.2	3 19.1
18	23 24.3	0 47.5	23 26.8	1 39.8	23 22.7	2 31.1	23 11.9	3 20.1
20	23 24.5	0 48.6	23 26.8	1 40.9	23 22.5	2 32.2	23 11.7	3 21.0
22	23 24.6	0 49.7	23 26.8	1 42.0	23 22.3	2 33.2	23 11.4	3 22.0
H. D.	0.1	0.5	0.0	0.5	0.1	0.5	0.1	0.5
	Friday 18.		Tuesday 22.		Saturday 26.		Wednesday 30.	
0	+23 24.7	−0 50.8	+23 26.7	−1 43.1	+23 22.2	−2 34.3	+23 11.1	−3 23.0
2	23 24.8	0 51.9	23 26.7	1 44.2	23 22.0	2 35.3	23 10.8	3 24.0
4	23 24.9	0 53.0	23 26.7	1 45.2	23 21.8	2 36.4	23 10.5	3 25.0
6	23 25.0	0 54.1	23 26.6	1 46.3	23 21.7	2 37.4	23 10.1	3 25.9
8	23 25.1	0 55.2	23 26.6	1 47.4	23 21.5	2 38.5	23 9.8	3 26.9
10	23 25.2	0 56.3	23 26.6	1 48.5	23 21.3	2 39.5	23 9.5	3 27.9
12	23 25.3	0 57.4	23 26.5	1 49.6	23 21.1	2 40.5	23 9.2	3 28.9
14	23 25.4	0 58.4	23 26.5	1 50.6	23 21.0	2 41.6	23 8.9	3 29.8
16	23 25.5	0 59.5	23 26.4	1 51.7	23 20.8	2 42.6	23 8.6	3 30.8
18	23 25.6	1 0.6	23 26.4	1 52.8	23 20.6	2 43.7	23 8.2	3 31.8
20	23 25.7	1 1.7	23 26.3	1 53.9	23 20.4	2 44.7	23 7.9	3 32.7
22	23 25.7	1 2.8	23 26.3	1 55.0	23 20.2	2 45.7	+23 7.6	−3 33.7
H. D.	0.0	0.5	0.0	0.5	0.1	0.5	0.2	0.5
	Saturday 19.		Wednesday 23.		Sunday 27.			
0	+23 25.8	−1 3.9	+23 26.2	−1 56.0	+23 20.0	−2 46.7		
2	23 25.9	1 5.0	23 26.1	1 57.1	23 19.8	2 47.8		
4	23 26.0	1 6.1	23 26.1	1 58.2	23 19.6	2 48.8		
6	23 26.0	1 7.2	23 26.0	1 59.3	23 19.4	2 49.8		
8	23 26.1	1 8.3	23 25.9	2 0.3	23 19.2	2 50.9		
10	23 26.2	1 9.3	23 25.9	2 1.4	23 19.0	2 51.9		
12	23 26.2	1 10.4	23 25.8	2 2.5	23 18.8	2 52.9		
14	23 26.3	1 11.5	23 25.7	2 3.6	23 18.5	2 53.9		
16	23 26.3	1 12.6	23 25.6	2 4.6	23 18.3	2 55.0		
18	23 26.4	1 13.7	23 25.5	2 5.7	23 18.1	2 56.0		
20	23 26.4	1 14.8	23 25.5	2 6.8	23 17.9	2 57.0		
22	23 26.5	1 15.9	23 25.4	2 7.8	23 17.7	2 58.0		
H. D.	0.0	0.5	0.0	0.5	0.1	0.5		
	Sunday 20.		Thursday 24.		Monday 28.			
0	+23 26.5	−1 17.0	+23 25.3	−2 8.9	+23 17.4	−2 59.0		
2	23 26.6	1 18.1	23 25.2	2 10.0	23 17.2	3 0.1		
4	23 26.6	1 19.2	23 25.1	2 11.0	23 17.0	3 1.1		
6	23 26.6	1 20.3	23 25.0	2 12.1	23 16.7	3 2.1		
8	23 26.7	1 21.3	23 24.9	2 13.2	23 16.5	3 3.1		
10	23 26.7	1 22.4	23 24.8	2 14.2	23 16.2	3 4.1		
12	23 26.7	1 23.5	23 24.7	2 15.3	23 16.0	3 5.1		
14	23 26.8	1 24.6	23 24.5	2 16.4	23 15.7	3 6.1		
16	23 26.8	1 25.7	23 24.4	2 17.4	23 15.5	3 7.1		
18	23 26.8	1 26.8	23 24.3	2 18.5	23 15.2	3 8.1		
20	23 26.8	1 27.9	23 24.2	2 19.5	23 15.0	3 9.1		
22	+23 26.8	−1 29.0	+23 24.1	−2 20.6	+23 14.7	−3 10.1		
H. D.	0.0	0.5	0.1	0.5	0.1	0.5		

SEMIDIAMETER.

	′
June 1	15.80
11	15.78
21	15.77
July 1	15.76

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Thursday 1.		Monday 5.		Friday 9.		Tuesday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+23 7.3	−3 34.7	+22 48.0	−4 18.6	+22 22.5	−4 57.3	+21 50.7	−5 29.9
2	23 6.9	3 35.6	22 47.6	4 19.4	22 21.9	4 58.1	21 50.0	5 30.5
4	23 6.6	3 36.6	22 47.1	4 20.3	22 21.3	4 58.8	21 49.3	5 31.1
6	23 6.2	3 37.5	22 46.6	4 21.1	22 20.7	4 59.6	21 48.5	5 31.7
8	23 5.9	3 38.5	22 46.1	4 22.0	22 20.1	5 0.3	21 47.8	5 32.3
10	23 5.6	3 39.4	22 45.7	4 22.9	22 19.4	5 1.0	21 47.1	5 32.9
12	23 5.2	3 40.4	22 45.2	4 23.7	22 18.8	5 1.8	21 46.3	5 33.5
14	23 4.9	3 41.3	22 44.7	4 24.6	22 18.2	5 2.5	21 45.6	5 34.1
16	23 4.5	3 42.3	22 44.2	4 25.4	22 17.6	5 3.2	21 44.8	5 34.6
18	23 4.1	3 43.2	22 43.7	4 26.2	22 17.0	5 3.9	21 44.1	5 35.2
20	23 3.8	3 44.2	22 43.2	4 27.1	22 16.4	5 4.7	21 43.3	5 35.8
22	23 3.4	3 45.1	22 42.7	4 27.9	22 15.7	5 5.4	21 42.6	5 36.4
H. D.	0.2	0.5	0.2	0.4	0.3	0.4	0.4	0.3
	Friday 2.		Tuesday 6.		Saturday 10.		Wednesday 14.	
0	+23 3.1	−3 46.1	+22 42.2	−4 28.8	+22 15.1	−5 6.1	+21 41.8	−5 36.9
2	23 2.7	3 47.0	22 41.7	4 29.6	22 14.5	5 6.8	21 41.1	5 37.5
4	23 2.3	3 47.9	22 41.2	4 30.4	22 13.8	5 7.5	21 40.3	5 38.1
6	23 1.9	3 48.9	22 40.7	4 31.3	22 13.2	5 8.2	21 39.6	5 38.6
8	23 1.6	3 49.8	22 40.2	4 32.1	22 12.6	5 8.9	21 38.8	5 39.2
10	23 1.2	3 50.7	22 39.7	4 32.9	22 11.9	5 9.6	21 38.0	5 39.7
12	23 0.8	3 51.7	22 39.2	4 33.7	22 11.3	5 10.3	21 37.3	5 40.3
14	23 0.4	3 52.6	22 38.7	4 34.6	22 10.6	5 11.0	21 36.5	5 40.8
16	23 0.0	3 53.5	22 38.1	4 35.4	22 10.0	5 11.7	21 35.7	5 41.4
18	22 59.6	3 54.4	22 37.6	4 36.2	22 9.3	5 12.4	21 34.9	5 41.9
20	22 59.2	3 55.3	22 37.1	4 37.0	22 8.7	5 13.1	21 34.1	5 42.4
22	22 58.8	3 56.3	22 36.6	4 37.8	22 8.0	5 13.8	21 33.4	5 43.0
H. D.	0.2	0.5	0.3	0.4	0.3	0.3	0.4	0.3
	Saturday 3.		Wednesday 7.		Sunday 11.		Thursday 15.	
0	+22 58.4	−3 57.2	+22 36.0	−4 38.6	+22 7.4	−5 14.5	+21 32.6	−5 43.5
2	22 58.0	3 58.1	22 35.5	4 39.5	22 6.7	5 15.1	21 31.8	5 44.0
4	22 57.6	3 59.0	22 35.0	4 40.3	22 6.0	5 15.8	21 31.0	5 44.5
6	22 57.2	3 59.9	22 34.4	4 41.1	22 5.4	5 16.5	21 30.2	5 45.1
8	22 56.8	4 0.8	22 33.9	4 41.9	22 4.7	5 17.2	21 29.4	5 45.6
10	22 56.4	4 1.7	22 33.3	4 42.7	22 4.0	5 17.8	21 28.6	5 46.1
12	22 56.0	4 2.6	22 32.8	4 43.5	22 3.3	5 18.5	21 27.8	5 46.6
14	22 55.6	4 3.5	22 32.2	4 44.2	22 2.7	5 19.1	21 27.0	5 47.1
16	22 55.2	4 4.4	22 31.7	4 45.0	22 2.0	5 19.8	21 26.2	5 47.6
18	22 54.7	4 5.3	22 31.1	4 45.8	22 1.3	5 20.5	21 25.4	5 48.1
20	22 54.3	4 6.2	22 30.6	4 46.6	22 0.6	5 21.1	21 24.6	5 48.6
22	22 53.9	4 7.1	22 30.0	4 47.4	21 59.9	5 21.8	21 23.8	5 49.1
H. D.	0.2	0.5	0.3	0.4	0.3	0.3	0.4	0.3
	Sunday 4.		Thursday 8.		Monday 12.		Friday 16.	
0	+22 53.4	−4 8.0	+22 29.4	−4 48.2	+21 59.2	−5 22.4	+21 23.0	−5 49.6
2	22 53.0	4 8.9	22 28.9	4 48.9	21 58.5	5 23.0	21 22.1	5 50.0
4	22 52.6	4 9.8	22 28.3	4 49.7	21 57.8	5 23.7	21 21.3	5 50.5
6	22 52.1	4 10.7	22 27.7	4 50.5	21 57.1	5 24.3	21 20.5	5 51.0
8	22 51.7	4 11.6	22 27.2	4 51.3	21 56.4	5 24.9	21 19.7	5 51.5
10	22 51.2	4 12.4	22 26.6	4 52.0	21 55.7	5 25.6	21 18.8	5 51.9
12	22 50.8	4 13.3	22 26.0	4 52.8	21 55.0	5 26.2	21 18.0	5 52.4
14	22 50.3	4 14.2	22 25.4	4 53.6	21 54.3	5 26.8	21 17.2	5 52.9
16	22 49.9	4 15.1	22 24.8	4 54.3	21 53.6	5 27.4	21 16.3	5 53.3
18	22 49.4	4 15.9	22 24.2	4 55.1	21 52.9	5 28.1	21 15.5	5 53.8
20	22 49.0	4 16.8	22 23.7	4 55.8	21 52.2	5 28.7	21 14.7	5 54.2
22	+22 48.5	−4 17.7	+22 23.1	−4 56.6	+21 51.4	−5 29.3	+21 13.8	−5 54.7
H. D.	0.2	0.4	0.3	0.4	0.4	0.3	0.4	0.2

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Saturday 17.		Wednesday 21.		Sunday 25.		Thursday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+21 13.0	−5 55.1	+20 29.5	−6 11.8	+19 40.5	−6 19.3	+18 46.3	−6 17.1
2	21 12.1	5 55.6	20 28.5	6 12.1	19 39.4	6 19.3	18 45.2	6 16.9
4	21 11.3	5 56.0	20 27.6	6 12.3	19 38.4	6 19.4	18 44.0	6 16.8
6	21 10.4	5 56.4	20 26.6	6 12.6	19 37.3	6 19.4	18 42.8	6 16.6
8	21 9.6	5 56.8	20 25.6	6 12.8	19 36.2	6 19.5	18 41.6	6 16.5
10	21 8.7	5 57.3	20 24.6	6 13.1	19 35.1	6 19.5	18 40.4	6 16.3
12	21 7.8	5 57.7	20 23.7	6 13.3	19 34.0	6 19.6	18 39.2	6 16.1
14	21 7.0	5 58.1	20 22.7	6 13.5	19 32.9	6 19.6	18 38.0	6 16.0
16	21 6.1	5 58.5	20 21.7	6 13.7	19 31.9	6 19.6	18 36.8	6 15.8
18	21 5.2	5 58.9	20 20.7	6 14.0	19 30.8	6 19.6	18 35.6	6 15.6
20	21 4.4	5 59.3	20 19.7	6 14.2	19 29.7	6 19.6	18 34.4	6 15.4
22	21 3.5	5 59.7	20 18.7	6 14.4	19 28.6	6 19.6	18 33.2	6 15.2
H. D.	0.4	0.2	0.5	0.1	0.5	0.0	0.6	0.1
	Sunday 18.		Thursday 22.		Monday 26.		Friday 30.	
0	+21 2.6	−6 0.1	+20 17.8	−6 14.6	+19 27.5	−6 19.7	+18 32.0	−6 15.0
2	21 1.8	6 0.5	20 16.8	6 14.8	19 26.3	6 19.7	18 30.8	6 14.8
4	21 0.9	6 0.9	20 15.8	6 15.0	19 25.2	6 19.7	18 29.6	6 14.6
6	21 0.0	6 1.3	20 14.8	6 15.2	19 24.1	6 19.6	18 28.4	6 14.4
8	20 59.1	6 1.7	20 13.8	6 15.4	19 23.0	6 19.6	18 27.2	6 14.2
10	20 58.2	6 2.1	20 12.8	6 15.6	19 21.9	6 19.6	18 25.9	6 14.0
12	20 57.3	6 2.4	20 11.8	6 15.7	19 20.8	6 19.6	18 24.7	6 13.7
14	20 56.4	6 2.8	20 10.7	6 15.9	19 19.7	6 19.6	18 23.5	6 13.5
16	20 55.5	6 3.2	20 9.7	6 16.1	19 18.6	6 19.6	18 22.3	6 13.3
18	20 54.6	6 3.5	20 8.7	6 16.3	19 17.4	6 19 5	18 21.1	6 13.1
20	20 53.7	6 3.9	20 7.7	6 16.4	19 16.3	6 19.5	18 19.8	6 12.8
22	20 52.8	6 4.2	20 6.7	6 16.6	19 15.2	6 19.4	18 18.6	6 12.6
H. D.	0.4	0.2	0.5	0.1	0.6	0.0	0.6	0.1
	Monday 19.		Friday 23.		Tuesday 27.		Saturday 31.	
0	+20 51.9	−6 4.6	+20 5.7	−6 16.8	+19 14.1	−6 19.4	+18 17.4	−6 12.3
2	20 51.0	6 4.9	20 4.7	6 16.9	19 12.9	6 19.4	18 16.1	6 12.1
4	20 50.1	6 5.3	20 3.6	6 17.1	19 11.8	6 19.3	18 14.9	6 11.8
6	20 49.2	6 5.6	20 2.6	6 17.2	19 10.7	6 19.2	18 13.7	6 11.6
8	20 48.3	6 6.0	20 1.6	6 17.3	19 9.5	6 19.2	18 12.4	6 11.3
10	20 47.4	6 6.3	20 0.5	6 17.5	19 8.4	6 19.1	18 11.2	6 11.0
12	20 46.5	6 6.6	19 59.5	6 17.6	19 7.2	6 19.1	18 9.9	6 10.8
14	20 45.5	6 6.9	19 58.5	6 17.7	19 6.1	6 19.0	18 8.7	6 10.5
16	20 44.6	6 7.3	19 57.4	6 17.9	19 5.0	6 18.9	18 7.4	6 10.2
18	20 43.7	6 7.6	19 56.4	6 18.0	19 3.8	6 18.8	18 6.2	6 9.9
20	20 42.7	6 7.9	19 55.4	6 18.1	19 2.7	6 18.7	18 4.9	6 9.6
22	20 41.8	6 8.2	19 54.3	6 18.2	19 1.5	6 18.6	+18 3.7	−6 9.4
H. D.	0.5	0.2	0.5	0.1	0.6	0.0	0.6	0.1
	Tuesday 20.		Saturday 24.		Wednesday 28.			
0	+20 40.9	−6 8.5	+19 53.3	−6 18.3	+19 0.4	−6 18.6		
2	20 39.9	6 8.8	19 52.2	6 18.4	18 59.2	6 18.5		
4	20 39.0	6 9.1	19 51.2	6 18.5	18 58.0	6 18.4		
6	20 38.1	6 9.4	19 50.1	6 18.6	18 56.9	6 18.2		
8	20 37.1	6 9.7	19 49.1	6 18.7	18 55.7	6 18.1		
10	20 36.2	6 10.0	19 48.0	6 18.8	18 54.6	6 18.0		
12	20 35.2	6 10.2	19 46.9	6 18.9	18 53.4	6 17.9		
14	20 34.3	6 10.5	19 45.9	6 19.0	18 52.2	6 17.8		
16	20 33.3	6 10.8	19 44.8	6 19.0	18 51.0	6 17.6		
18	20 32.4	6 11.1	19 43.7	6 19.1	18 49.9	6 17.5		
20	20 31.4	6 11.3	19 42.7	6 19.2	18 48.7	6 17.4		
22	+20 30.5	−6 11.6	+19 41.6	−6 19.2	+18 47.5	−6 17.2		
H. D.	0.5	0.1	0.5	0.0	0.6	0.1		

SEMIDIAMETER.

	′
July 1	15.76
11	15.76
21	15.77
31	15.79

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Sunday 1.		Thursday 5.		Monday 9.		Friday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+18 2.4	−6 9.1	+16 59.8	−5 50.0	+15 52.7	−5 21.6	+14 41.6	−4 44.3
2	18 1.2	6 8.8	16 58.4	5 49.5	15 51.3	5 20.9	14 40.0	4 43.4
4	17 59.9	6 8.4	16 57.1	5 49.0	15 49.8	5 20.2	14 38.5	4 42.5
6	17 58.7	6 8.1	16 55.7	5 48.5	15 48.4	5 19.5	14 37.0	4 41.7
8	17 57.4	6 7.8	16 54.4	5 48.0	15 46.9	5 18.8	14 35.5	4 40.8
10	17 56.1	6 7.5	16 53.0	5 47.5	15 45.5	5 18.1	14 33.9	4 39.9
12	17 54.9	6 7.2	16 51.7	5 46.9	15 44.0	5 17.4	14 32.4	4 39.0
14	17 53.6	6 6.9	16 50.3	5 46.4	15 42.6	5 16.7	14 30.9	4 38.1
16	17 52.3	6 6.5	16 48.9	5 45.9	15 41.1	5 16.0	14 29.3	4 37.2
18	17 51.0	6 6.2	16 47.5	5 45.4	15 39.7	5 15.3	14 27.8	4 36.3
20	17 49.8	6 5.9	16 46.2	5 44.8	15 38.2	5 14.6	14 26.3	4 35.4
22	17 48.5	6 5.5	16 44.8	5 44.3	15 36.8	5 13.8	14 24.7	4 34.5
H. D.	0.6	0.2	0.7	0.3	0.7	0.4	0.8	0.4
	Monday 2.		Friday 6.		Tuesday 10.		Saturday 14.	
0	+17 47.2	−6 5.2	+16 43.4	−5 43.7	+15 35.3	−5 13.1	+14 23.2	−4 33.6
2	17 45.9	6 4.8	16 42.1	5 43.2	15 33.8	5 12.4	14 21.6	4 32.7
4	17 44.6	6 4.5	16 40.7	5 42.6	15 32.4	5 11.6	14 20.1	4 31.7
6	17 43.4	6 4.1	16 39.3	5 42.1	15 30.9	5 10.9	14 18.5	4 30.8
8	17 42.1	6 3.7	16 37.9	5 41.5	15 29.4	5 10.2	14 17.0	4 29.9
10	17 40.8	6 3.4	16 36.5	5 41.0	15 28.0	5 9.4	14 15.4	4 29.0
12	17 39.5	6 3.0	16 35.1	5 40.4	15 26.5	5 8.7	14 13.9	4 28.0
14	17 38.2	6 2.6	16 33.8	5 39.8	15 25.0	5 7.9	14 12.3	4 27.1
16	17 36.9	6 2.3	16 32.4	5 39.3	15 23.6	5 7.1	14 10.8	4 26.1
18	17 35.6	6 1.9	16 31.0	5 38.7	15 22.1	5 6.4	14 9.2	4 25.2
20	17 34.3	6 1.5	16 29.6	5 38.1	15 20.6	5 5.6	14 7.7	4 24.2
22	17 33.0	6 1.1	16 28.2	5 37.5	15 19.1	5 4.8	14 6.1	4 23.3
H. D.	0.6	0.2	0.7	0.3	0.7	0.4	0.8	0.5
	Tuesday 3.		Saturday 7.		Wednesday 11.		Sunday 15.	
0	+17 31.7	−6 0.7	+16 26.8	−5 36.9	+15 17.6	−5 4.1	+14 4.6	−4 22.3
2	17 30.4	6 0.3	16 25.4	5 36.3	15 16.2	5 3.3	14 3.0	4 21.4
4	17 29.1	5 59.9	16 24.0	5 35.7	15 14.7	5 2.5	14 1.4	4 20.4
6	17 27.8	5 59.5	16 22.6	5 35.1	15 13.2	5 1.7	13 59.9	4 19.4
8	17 26.4	5 59.1	16 21.2	5 34.5	15 11.7	5 0.9	13 58.3	4 18.5
10	17 25.1	5 58.7	16 19.8	5 33.9	15 10.2	5 0.1	13 56.7	4 17.5
12	17 23.8	5 58.2	16 18.4	5 33.3	15 8.7	4 59.3	13 55.2	4 16.5
14	17 22.5	5 57.8	16 17.0	5 32.7	15 7.2	4 58.5	13 53.6	4 15.5
16	17 21.2	5 57.4	16 15.6	5 32.1	15 5.7	4 57.7	13 52.0	4 14.5
18	17 19.9	5 56.9	16 14.1	5 31.5	15 4.2	4 56.9	13 50.4	4 13.6
20	17 18.5	5 56.5	16 12.7	5 30.8	15 2.7	4 56.1	13 48.9	4 12.6
22	17 17.2	5 56.1	16 11.3	5 30.2	15 1.2	4 55.3	13 47.3	4 11.6
H. D.	0.7	0.2	0.7	0.3	0.7	0.4	0.8	0.5
	Wednesday 4.		Sunday 8.		Thursday 12.		Monday 16.	
0	+17 15.9	−5 55.6	+16 9.9	−5 29.6	+14 59.7	−4 54.4	+13 45.7	−4 10.6
2	17 14.6	5 55.2	16 8.5	5 28.9	14 58.2	4 53.6	13 44.1	4 9.5
4	17 13.2	5 54.7	16 7.1	5 28.3	14 56.7	4 52.8	13 42.5	4 8.5
6	17 11.9	5 54.3	16 5.6	5 27.6	14 55.2	4 52.0	13 41.0	4 7.5
8	17 10.6	5 53.8	16 4.2	5 27.0	14 53.7	4 51.1	13 39.4	4 6.5
10	17 9.2	5 53.3	16 2.8	5 26.3	14 52.2	4 50.3	13 37.8	4 5.5
12	17 7.9	5 52.9	16 1.3	5 25.7	14 50.7	4 49.4	13 36.2	4 4.5
14	17 6.5	5 52.4	15 59.9	5 25.0	14 49.2	4 48.6	13 34.6	4 3.4
16	17 5.2	5 51.9	15 58.5	5 24.3	14 47.6	4 47.7	13 33.0	4 2.4
18	17 3.8	5 51.4	15 57.0	5 23.7	14 46.1	4 46.9	13 31.4	4 1.4
20	17 2.5	5 51.0	15 55.6	5 23.0	14 44.6	4 46.0	13 29.8	4 0.3
22	+17 1.1	−5 50.5	+15 54.2	−5 22.3	+14 43.1	−4 45.2	+13 28.2	−3 59.3
H. D.	0.7	0.2	0.7	0.3	0.8	0.4	0.8	0.5

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Tuesday 17.		Saturday 21.		Wednesday 25.		Sunday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+13 26.7	−3 58.2	+12 8.3	−3 3.9	+10 47.0	−2 1.8	+9 22.9	−0 53.0
2	13 25.1	3 57.2	12 6.7	3 2.6	10 45.2	2 0.4	9 21.1	0 51.5
4	13 23.5	3 56.1	12 5.0	3 1.4	10 43.5	1 59.1	9 19.3	0 50.0
6	13 21.9	3 55.1	12 3.3	3 0.2	10 41.8	1 57.7	9 17.5	0 48.5
8	13 20.2	3 54.0	12 1.7	2 59.0	10 40.1	1 56.3	9 15.8	0 47.0
10	13 18.6	3 53.0	12 0.0	2 57.7	10 38.3	1 54.9	9 14.0	0 45.5
12	13 17.0	3 51.9	11 58.3	2 56.5	10 36.6	1 53.5	9 12.2	0 44.0
14	13 15.4	3 50.8	11 56.7	2 55.3	10 34.9	1 52.2	9 10.4	0 42.5
16	13 13.8	3 49.7	11 55.0	2 54.0	10 33.1	1 50.8	9 8.6	0 41.0
18	13 12.2	3 48.7	11 53.3	2 52.8	10 31.4	1 49.4	9 6.8	0 39.5
20	13 10.6	3 47.6	11 51.6	2 51.5	10 29.7	1 48.0	9 5.0	0 38.0
22	13 9.0	3 46.5	11 50.0	2 50.3	10 27.9	1 46.6	9 3.3	0 36.4
H. D.	0.8	0.5	0.8	0.6	0.9	0.7	0.9	0.8
	Wednesday 18.		Sunday 22.		Thursday 26.		Monday 30.	
0	+13 7.4	−3 45.4	+11 48.3	−2 49.0	+10 26.2	−1 45.2	+9 1.5	−0 34.9
2	13 5.8	3 44.3	11 46.6	2 47.8	10 24.5	1 43.8	8 59.7	0 33.4
4	13 4.1	3 43.2	11 44.9	2 46.5	10 22.7	1 42.4	8 57.9	0 31.9
6	13 2.5	3 42.1	11 43.2	2 45.2	10 21.0	1 41.0	8 56.1	0 30.3
8	13 0.9	3 41.0	11 41.5	2 44.0	10 19.2	1 39.6	8 54.3	0 28.8
10	12 59.3	3 39.9	11 39.9	2 42.7	10 17.5	1 38.2	8 52.5	0 27.3
12	12 57.7	3 38.8	11 38.2	2 41.4	10 15.7	1 36.7	8 50.7	0 25.7
14	12 56.0	3 37.7	11 36.5	2 40.2	10 14.0	1 35.3	8 48.9	0 24.2
16	12 54.4	3 36.6	11 34.8	2 38.9	10 12.2	1 33.9	8 47.1	0 22.7
18	12 52.8	3 35.4	11 33.1	2 37.6	10 10.5	1 32.5	8 45.3	0 21.1
20	12 51.2	3 34.3	11 31.4	2 36.3	10 8.8	1 31.0	8 43.5	0 19.6
22	12 49.5	3 33.2	11 29.7	2 35.0	10 7.0	1 29.6	8 41.7	0 18.0
H. D.	0.8	0.6	0.8	0.6	0.9	0.7	0.9	0.8
	Thursday 19.		Monday 23.		Friday 27.		Tuesday 31.	
0	+12 47.9	−3 32.1	+11 28.0	−2 33.7	+10 5.3	−1 28.2	+8 39.9	−0 16.5
2	12 46.3	3 30.9	11 26.3	2 32.4	10 3.5	1 26.8	8 38.1	0 14.9
4	12 44.6	3 29.8	11 24.6	2 31.1	10 1.7	1 25.3	8 36.3	0 13.4
6	12 43.0	3 28.6	11 22.9	2 29.8	10 0.0	1 23.9	8 34.5	0 11.8
8	12 41.4	3 27.5	11 21.2	2 28.5	9 58.2	1 22.4	8 32.7	0 10.3
10	12 39.7	3 26.3	11 19.5	2 27.2	9 56.5	1 21.0	8 30.9	0 8.7
12	12 38.1	3 25.2	11 17.8	2 25.9	9 54.7	1 19.5	8 29.1	0 7.2
14	12 36.5	3 24.0	11 16.1	2 24.6	9 53.0	1 18.1	8 27.3	0 5.6
16	12 34.8	3 22.9	11 14.4	2 23.3	9 51.2	1 16.6	8 25.5	0 4.0
18	12 33.2	3 21.7	11 12.7	2 22.0	9 49.4	1 15.2	8 23.7	0 2.5
20	12 31.5	3 20.5	11 11.0	2 20.6	9 47.7	1 13.7	8 21.8	−0 0.9
22	12 29.9	3 19.4	11 9.3	2 19.3	9 45.9	1 12.3	+8 20.0	+0 0.7
H. D.	0.8	0.6	0.9	0.7	0.9	0.7	0.9	0.8
	Friday 20.		Tuesday 24.		Saturday 28.			
0	+12 28.2	−3 18.2	+11 7.6	−2 18.0	+ 9 44.1	−1 10.8		
2	12 26.6	3 17.0	11 5.9	2 16.7	9 42.4	1 9.3		
4	12 24.9	3 15.8	11 4.2	2 15.3	9 40.6	1 7.9		
6	12 23.3	3 14.7	11 2.4	2 14.0	9 38.8	1 6.4		
8	12 21.6	3 13.5	11 0.7	2 12.6	9 37.1	1 4.9		
10	12 20.0	3 12.3	10 59.0	2 11.3	9 35.3	1 3.4		
12	12 18.3	3 11.1	10 57.3	2 9.9	9 33.5	1 2.0		
14	12 16.6	3 9.9	10 55.6	2 8.6	9 31.8	1 0.5		
16	12 15.0	3 8.7	10 53.9	2 7.2	9 30.0	0 59.0		
18	12 13.3	3 7.5	10 52.1	2 5.9	9 28.2	0 57.5		
20	12 11.7	3 6.3	10 50.4	2 4.5	9 26.4	0 56.0		
22	+12 10.0	−3 5.1	+10 48.7	−2 3.2	+ 9 24.7	−0 54.5		
H. D.	0.8	0.6	0.9	0.7	0.9	0.7		

SEMIDIAMETER.

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Aug. 1	15.79
11	15.81
21	15.85
31	15.88

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Wednesday 1.		Sunday 5.		Thursday 9.		Monday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+8 18.2	+0 2.3	+6 50.1	+1 19.9	+5 20.3	+2 40.9	+3 48.9	+4 4.2
2	8 16.4	0 3.8	6 48.3	1 21.6	5 18.4	2 42.6	3 47.0	4 5.9
4	8 14.6	0 5.4	6 46.4	1 23.2	5 16.5	2 44.3	3 45.1	4 7.7
6	8 12.8	0 7.0	6 44.6	1 24.9	5 14.6	2 46.1	3 43.1	4 9.4
8	8 11.0	0 8.6	6 42.7	1 26.5	5 12.7	2 47.8	3 41.2	4 11.2
10	8 9.1	0 10.1	6 40.9	1 28.2	5 10.8	2 49.5	3 39.3	4 12.9
12	8 7.3	0 11.7	6 39.0	1 29.9	5 8.9	2 51.2	3 37.4	4 14.7
14	8 5.5	0 13.3	6 37.1	1 31.5	5 7.0	2 52.9	3 35.5	4 16.4
16	8 3.7	0 14.9	6 35.3	1 33.2	5 5.1	2 54.7	3 33.6	4 18.2
18	8 1.9	0 16.5	6 33.4	1 34.9	5 3.2	2 56.4	3 31.6	4 19.9
20	8 0.0	0 18.1	6 31.5	1 36.5	5 1.3	2 58.1	3 29.7	4 21.7
22	7 58.2	0 19.7	6 29.7	1 38.2	4 59.4	2 59.8	3 27.8	4 23.5
H. D.	0.9	0.8	0.9	0.8	0.9	0.9	1.0	0.9
	Thursday 2.		Monday 6.		Friday 10.		Tuesday 14.	
0	+7 56.4	+0 21.3	+6 27.8	+1 39.9	+4 57.5	+3 1.5	+3 25.9	+4 25.2
2	7 54.6	0 22.9	6 26.0	1 41.6	4 55.6	3 3.3	3 24.0	4 27.0
4	7 52.7	0 24.5	6 24.1	1 43.2	4 53.7	3 5.0	3 22.0	4 28.7
6	7 50.9	0 26.1	6 22.2	1 44.9	4 51.8	3 6.7	3 20.1	4 30.5
8	7 49.1	0 27.7	6 20.4	1 46.6	4 49.9	3 8.5	3 18.2	4 32.3
10	7 47.3	0 29.3	6 18.5	1 48.3	4 48.0	3 10.2	3 16.3	4 34.0
12	7 45.4	0 30.9	6 16.6	1 49.9	4 46.1	3 11.9	3 14.3	4 35.8
14	7 43.6	0 32.5	6 14.8	1 51.6	4 44.2	3 13.6	3 12.4	4 37.5
16	7 41.8	0 34.1	6 12.9	1 53.3	4 42.3	3 15.4	3 10.5	4 39.3
18	7 39.9	0 35.7	6 11.0	1 55.0	4 40.4	3 17.1	3 8.6	4 41.1
20	7 38.1	0 37.3	6 9.1	1 56.7	4 38.5	3 18.8	3 6.6	4 42.8
22	7 36.3	0 39.0	6 7.3	1 58.4	4 36.6	3 20.6	3 4.7	4 44.6
H. D.	0.9	0.8	0.9	0.8	1.0	0.9	1.0	0.9
	Friday 3.		Tuesday 7.		Saturday 11.		Wednesday 15.	
0	+7 34.4	+0 40.6	+6 5.4	+2 0.1	+4 34.7	+3 22.3	+3 2.8	+4 46.3
2	7 32.6	0 42.2	6 3.5	2 1.7	4 32.8	3 24.0	3 0.9	4 48.1
4	7 30.8	0 43.8	6 1.7	2 3.4	4 30.9	3 25.8	2 58.9	4 49.9
6	7 28.9	0 45.4	5 59.8	2 5.1	4 29.0	3 27.5	2 57.0	4 51.6
8	7 27.1	0 47.1	5 57.9	2 6.8	4 27.1	3 29.3	2 55.1	4 53.4
10	7 25.3	0 48.7	5 56.0	2 8.5	4 25.2	3 31.0	2 53.2	4 55.1
12	7 23.4	0 50.3	5 54.2	2 10.2	4 23.3	3 32.7	2 51.2	4 56.9
14	7 21.6	0 52.0	5 52.3	2 11.9	4 21.4	3 34.5	2 49.3	4 58.7
16	7 19.7	0 53.6	5 50.4	2 13.6	4 19.5	3 36.2	2 47.4	5 0.4
18	7 17.9	0 55.2	5 48.5	2 15.3	4 17.6	3 38.0	2 45.4	5 2.2
20	7 16.0	0 56.9	5 46.6	2 17.0	4 15.7	3 39.7	2 43.5	5 4.0
22	7 14.2	0 58.5	5 44.8	2 18.7	4 13.8	3 41.4	2 41.6	5 5.7
H. D.	0.9	0.8	0.9	0.8	1.0	0.9	1.0	0.9
	Saturday 4.		Wednesday 8.		Sunday 12.		Thursday 16.	
0	+7 12.4	+1 0.1	+5 42.9	+2 20.4	+4 11.9	+3 43.2	+2 39.7	+5 7.5
2	7 10.5	1 1.8	5 41.0	2 22.1	4 9.9	3 44.9	2 37.7	5 9.3
4	7 8.7	1 3.4	5 39.1	2 23.8	4 8.0	3 46.7	2 35.8	5 11.0
6	7 6.8	1 5.1	5 37.2	2 25.5	4 6.1	3 48.4	2 33.9	5 12.8
8	7 5.0	1 6.7	5 35.3	2 27.2	4 4.2	3 50.2	2 31.9	5 14.6
10	7 3.1	1 8.3	5 33.5	2 28.9	4 2.3	3 51.9	2 30.0	5 16.3
12	7 1.3	1 10.0	5 31.6	2 30.6	4 0.4	3 53.7	2 28.1	5 18.1
14	6 59.4	1 11.6	5 29.7	2 32.3	3 58.5	3 55.4	2 26.1	5 19.9
16	6 57.6	1 13.3	5 27.8	2 34.1	3 56.6	3 57.2	2 24.2	5 21.6
18	6 55.7	1 14.9	5 25.9	2 35.8	3 54.6	3 58.9	2 22.3	5 23.4
20	6 53.9	1 16.6	5 24.0	2 37.5	3 52.7	4 0.7	2 20.3	5 25.2
22	+6 52.0	+1 18.2	+5 22.1	+2 39.2	+3 50.8	+4 2.4	+2 18.4	+5 26.9
H. D.	0.9	0.8	0.9	0.9	1.0	0.9	1.0	0.9

NOTE.—The Equation of Time is to be applied to the G. M. T, in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Friday 17.		Tuesday 21.		Saturday 25.		Wednesday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	+2 16.5	+5 28.7	+0 43.3	+6 53.4	−0 50.2	+8 17.0	−2 23.7	+ 9 38.2
2	2 14.5	5 30.5	0 41.4	6 55.2	0 52.1	8 18.8	2 25.7	9 39.8
4	2 12.6	5 32.2	0 39.4	6 56.9	0 54.1	8 20.5	2 27.6	9 41.5
6	2 10.7	5 34.0	0 37.5	6 58.7	0 56.0	8 22.2	2 29.6	9 43.1
8	2 8.7	5 35.8	0 35.5	7 0.4	0 58.0	8 23.9	2 31.5	9 44.8
10	2 6.8	5 37.5	0 33.6	7 2.2	0 59.9	8 25.6	2 33.4	9 46.4
12	2 4.9	5 39.3	0 31.6	7 4.0	1 1.9	8 27.4	2 35.4	9 48.1
14	2 2.9	5 41.1	0 29.7	7 5.7	1 3.8	8 29.1	2 37.3	9 49.7
16	2 1.0	5 42.8	0 27.7	7 7.5	1 5.8	8 30.8	2 39.3	9 51.3
18	1 59.0	5 44.6	0 25.8	7 9.2	1 7.7	8 32.5	2 41.2	9 53.0
20	1 57.1	5 46.4	0 23.8	7 11.0	1 9.7	8 34.2	2 43.2	9 54.6
22	1 55.2	5 48.1	0 21.9	7 12.7	1 11.6	8 35.9	2 45.1	9 56.3
H. D.	1.0	0.9	1.0	0.9	1.0	0.9	1.0	0.8
	Saturday 18.		Wednesday 22.		Sunday 26.		Thursday 30.	
0	+1 53.2	+5 49.9	+0 20.0	+7 14.5	−1 13.6	+8 37.6	−2 47.1	+ 9 57.9
2	1 51.3	5 51.7	0 18.0	7 16.2	1 15.5	8 39.3	2 49.0	9 59.5
4	1 49.3	5 53.4	0 16.1	7 18.0	1 17.5	8 41.0	2 50.9	10 1.1
6	1 47.4	5 55.2	0 14.1	7 19.7	1 19.4	8 42.7	2 52.9	10 2.8
8	1 45.5	5 57.0	0 12.2	7 21.5	1 21.4	8 44.4	2 54.8	10 4.4
10	1 43.5	5 58.7	0 10.2	7 23.2	1 23.3	8 46.1	2 56.8	10 6.0
12	1 41.6	6 0.5	0 8.3	7 25.0	1 25.3	8 47.8	2 58.7	10 7.6
14	1 39.7	6 2.3	0 6.3	7 26.7	1 27.2	8 49.5	3 0.7	10 9.3
16	1 37.7	6 4.0	0 4.4	7 28.5	1 29.2	8 51.2	3 2.6	10 10.9
18	1 35.8	6 5.8	0 2.4	7 30.2	1 31.1	8 52.9	3 4.5	10 12.5
20	1 33.8	6 7.6	+0 0.5	7 32.0	1 33.1	8 54.6	3 6.5	10 14.1
22	1 31.9	6 9.3	−0 1.5	7 33.7	1 35.0	8 56.3	−3 8.4	+10 15.7
H. D.	1.0	0.9	1.0	0.9	1.0	0.8	1.0	0.8
	Sunday 19.		Thursday 23.		Monday 27.			
0	+1 30.0	+6 11.1	−0 3.4	+7 35.4	−1 37.0	+8 58.0		
2	1 28.0	6 12.9	0 5.4	7 37.2	1 38.9	8 59.7		
4	1 26.1	6 14.6	0 7.3	7 38.9	1 40.9	9 1.4		
6	1 24.1	6 16.4	0 9.3	7 40.7	1 42.8	9 3.1		
8	1 22.2	6 18.2	0 11.2	7 42.4	1 44.8	9 4.8		
10	1 20.2	6 19.9	0 13.2	7 44.2	1 46.7	9 6.5		
12	1 18.3	6 21.7	0 15.1	7 45.9	1 48.7	9 8.1		
14	1 16.4	6 23.5	0 17.1	7 47.6	1 50.6	9 9.8		
16	1 14.4	6 25.2	0 19.0	7 49.4	1 52.6	9 11.5		
18	1 12.5	6 27.0	0 21.0	7 51.1	1 54.5	9 13.2		
20	1 10.5	6 28.8	0 22.9	7 52.8	1 56.5	9 14.9		
22	1 8.6	6 30.5	0 24.9	7 54.6	1 58.4	9 16.5		
H. D.	1.0	0.9	1.0	0.9	1.0	0.8		
	Monday 20.		Friday 24.		Tuesday 28.			
0	+1 6.6	+6 32.3	−0 26.8	+7 56.3	−2 0.4	+9 18.2		
2	1 4.7	6 34.0	0 28.8	7 58.0	2 2.3	9 19.9		
4	1 2.8	6 35.8	0 30.7	7 59.8	2 4.2	9 21.6		
6	1 0.8	6 37.6	0 32.6	8 1.5	2 6.2	9 23.2		
8	0 58.9	6 39.3	0 34.6	8 3.2	2 8.1	9 24.9		
10	0 56.9	6 41.1	0 36.5	8 5.0	2 10.1	9 26.6		
12	0 55.0	6 42.9	0 38.5	8 6.7	2 12.0	9 28.2		
14	0 53.0	6 44.6	0 40.4	8 8.4	2 14.0	9 29.9		
16	0 51.1	6 46.4	0 42.4	8 10.1	2 15.9	9 31.5		
18	0 49.2	6 48.1	0 44.3	8 11.9	2 17.9	9 33.2		
20	0 47.2	6 49.9	0 46.3	8 13.6	2 19.8	9 34.9		
22	+0 45.3	+6 51.7	−0 48.2	+8 15.3	−2 21.8	+9 36.5		
H. D.	1.0	0.9	1.0	0.9	1.0	0.8		

SEMIDIAMETER.

Sept. 1	15.88
11	15.92
21	15.97
Oct. 1	16.01

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Friday 1.		Tuesday 5.		Saturday 9.		Wednesday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−3 10.4	+10 17.3	−4 43.2	+11 31.8	−6 15.2	+12 40.1	−7 45.8	+13 41.1
2	3 12.3	10 18.9	4 45.2	11 33.3	6 17.1	12 41.5	7 47.7	13 42.3
4	3 14.2	10 20.5	4 47.1	11 34.8	6 19.0	12 42.8	7 49.6	13 43.5
6	3 16.2	10 22.1	4 49.0	11 36.3	6 20.9	12 44.2	7 51.4	13 44.6
8	3 18.1	10 23.7	4 50.9	11 37.8	6 22.8	12 45.5	7 53.3	13 45.8
10	3 20.1	10 25.3	4 52.9	11 39.2	6 24.7	12 46.8	7 55.2	13 47.0
12	3 22.0	10 26.9	4 54.8	11 40.7	6 26.6	12 48.2	7 57.0	13 48.2
14	3 23.9	10 28.5	4 56.7	11 42.2	6 28.5	12 49.5	7 58.9	13 49.3
16	3 25.9	10 30.1	4 58.6	11 43.7	6 30.4	12 50.8	8 0.8	13 50.5
18	3 27.8	10 31.7	5 0.5	11 45.1	6 32.3	12 52.1	8 2.6	13 51.6
20	3 29.8	10 33.3	5 2.5	11 46.6	6 34.2	12 53.5	8 4.5	13 52.8
22	3 31.7	10 34.9	5 4.4	11 48.1	6 36.1	12 54.8	8 6.4	13 53.9
H. D.	1.0	0.8	1.0	0.7	1.0	0.7	0.9	0.6
	Saturday 2.		Wednesday 6.		Sunday 10.		Thursday 14.	
0	−3 33.6	+10 36.5	−5 6.3	+11 49.5	−6 38.0	+12 56.1	−8 8.2	+13 55.1
2	3 35.6	10 38.0	5 8.2	11 51.0	6 39.9	12 57.4	8 10.1	13 56.2
4	3 37.5	10 39.6	5 10.2	11 52.4	6 41.8	12 58.7	8 12.0	13 57.4
6	3 39.5	10 41.2	5 12.1	11 53.9	6 43.7	13 0.0	8 13.8	13 58.5
8	3 41.4	10 42.8	5 14.0	11 55.3	6 45.6	13 1.3	8 15.7	13 59.6
10	3 43.3	10 44.3	5 15.9	11 56.8	6 47.5	13 2.6	8 17.5	14 0.8
12	3 45.3	10 45.9	5 17.8	11 58.2	6 49.3	13 3.9	8 19.4	14 1.9
14	3 47.2	10 47.5	5 19.8	11 59.7	6 51.2	13 5.2	8 21.3	14 3.0
16	3 49.1	10 49.0	5 21.7	12 1.1	6 53.1	13 6.5	8 23.1	14 4.1
18	3 51.1	10 50.6	5 23.6	12 2.5	6 55.0	13 7.8	8 25.0	14 5.2
20	3 53.0	10 52.2	5 25.5	12 4.0	6 56.9	13 9.0	8 26.8	14 6.3
22	3 55.0	10 53.7	5 27.4	12 5.4	6 58.8	13 10.3	8 28.7	14 7.4
H. D.	1.0	0.8	1.0	0.7	0.9	0.6	0.9	0.6
	Sunday 3.		Thursday 7.		Monday 11.		Friday 15.	
0	−3 56.9	+10 55.3	−5 29.3	+12 6.8	−7 0.7	+13 11.6	−8 30.5	+14 8.5
2	3 58.8	10 56.8	5 31.3	12 8.2	7 2.6	13 12.9	8 32.4	14 9.6
4	4 0.8	10 58.4	5 33.2	12 9.7	7 4.5	13 14.1	8 34.2	14 10.7
6	4 2.7	10 59.9	5 35.1	12 11.1	7 6.4	13 15.4	8 36.1	14 11.8
8	4 4.6	11 1.5	5 37.0	12 12.5	7 8.2	13 16.6	8 37.9	14 12.9
10	4 6.6	11 3.0	5 38.9	12 13.9	7 10.1	13 17.9	8 39.8	14 14.0
12	4 8.5	11 4.5	5 40.8	12 15.3	7 12.0	13 19.2	8 41.6	14 15.1
14	4 10.4	11 6.1	5 42.7	12 16.7	7 13.9	13 20.4	8 43.5	14 16.1
16	4 12.3	11 7.6	5 44.6	12 18.1	7 15.8	13 21.6	8 45.3	14 17.2
18	4 14.3	11 9.1	5 46.6	12 19.5	7 17.7	13 22.9	8 47.2	14 18.3
20	4 16.2	11 10.7	5 48.5	12 20.9	7 19.5	13 24.1	8 49.0	14 19.3
22	4 18.1	11 12.2	5 50.4	12 22.3	7 21.4	13 25.4	8 50.9	14 20.4
H. D.	1.0	0.8	1.0	0.7	0.9	0.6	0.9	0.5
	Monday 4.		Friday 8.		Tuesday 12.		Saturday 16.	
0	−4 20.1	+11 13.7	−5 52.3	+12 23.7	−7 23.3	+13 26.6	−8 52.7	+14 21.5
2	4 22.0	11 15.2	5 54.2	12 25.1	7 25.2	13 27.8	8 54.5	14 22.5
4	4 23.9	11 16.8	5 56.1	12 26.5	7 27.1	13 29.0	8 56.4	14 23.6
6	4 25.9	11 18.3	5 58.0	12 27.8	7 28.9	13 30.3	8 58.2	14 24.6
8	4 27.8	11 19.8	5 59.9	12 29.2	7 30.8	13 31.5	9 0.0	14 25.6
10	4 29.7	11 21.3	6 1.8	12 30.6	7 32.7	13 32.7	9 1.9	14 26.7
12	4 31.7	11 22.8	6 3.7	12 32.0	7 34.6	13 33.9	9 3.7	14 27.7
14	4 33.6	11 24.3	6 5.7	12 33.3	7 36.5	13 35.1	9 5.6	14 28.7
16	4 35.5	11 25.8	6 7.6	12 34.7	7 38.3	13 36.3	9 7.4	14 29.7
18	4 37.4	11 27.3	6 9.5	12 36.1	7 40.2	13 37.5	9 9.2	14 30.8
20	4 39.4	11 28.8	6 11.4	12 37.4	7 42.1	13 38.7	9 11.1	14 31.8
22	−4 41.3	+11 30.3	−6 13.3	+12 38.8	−7 44.0	+13 39.9	−9 12.9	+14 32.8
H. D.	1.0	0.8	1.0	0.7	0.9	0.6	0.9	0.5

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Sunday 17.		Thursday 21.		Monday 25.		Friday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−9 14.7	+14 33.6	−10 41.5	+15 17.2	−12 5.7	+15 50.4	−13 27.0	+16 12.2
2	9 16.6	14 34.8	10 43.3	15 18.0	12 7.4	15 51.0	13 28.6	16 12.5
4	9 18.4	14 35.8	10 45.1	15 18.8	12 9.2	15 51.5	13 30.3	16 12.9
6	9 20.2	14 36.8	10 46.9	15 19.6	12 10.9	15 52.1	13 32.0	16 13.2
8	9 22.1	14 37.8	10 48.6	15 20.4	12 12.6	15 52.6	13 33.6	16 13.5
10	9 23.9	14 38.8	10 50.4	15 21.2	12 14.3	15 53.2	13 35.3	16 13.8
12	9 25.7	14 39.7	10 52.2	15 22.0	12 16.1	15 53.8	13 36.9	16 14.1
14	9 27.5	14 40.7	10 54.0	15 22.7	12 17.8	15 54.3	13 38.6	16 14.4
16	9 29.4	14 41.7	10 55.7	15 23.5	12 19.5	15 54.8	13 40.2	16 14.7
18	9 31.2	14 42.7	10 57.5	15 24.3	12 21.2	15 55.4	13 41.9	16 14.9
20	9 33.0	14 43.6	10 59.3	15 25.0	12 22.9	15 55.9	13 43.5	16 15.2
22	9 34.8	14 44.6	11 1.1	15 25.8	12 24.6	15 56.4	13 45.1	16 15.5
H. D.	0.9	0.5	0.9	0.4	0.9	0.3	0.8	0.1
	Monday 18.		Friday 22.		Tuesday 26.		Saturday 30.	
0	−9 36.7	+14 45.6	−11 2.8	+15 26.5	−12 26.3	+15 56.9	−13 46.8	+16 15.8
2	9 38.5	14 46.5	11 4.6	15 27.3	12 28.0	15 57.5	13 48.4	16 16.0
4	9 40.3	14 47.5	11 6.4	15 28.0	12 29.7	15 58.0	13 50.1	16 16.3
6	9 42.1	14 48.4	11 8.1	15 28.7	12 31.5	15 58.5	13 51.7	16 16.5
8	9 43.9	14 49.4	11 9.9	15 29.5	12 33.2	15 59.0	13 53.3	16 16.8
10	9 45.7	14 50.3	11 11.7	15 30.2	12 34.9	15 59.5	13 55.0	16 17.0
12	9 47.6	14 51.2	11 13.4	15 30.9	12 36.6	16 0.0	13 56.6	16 17.2
14	9 49.4	14 52.2	11 15.2	15 31.6	12 38.3	16 0.4	13 58.2	16 17.5
16	9 51.2	14 53.1	11 16.9	15 32.4	12 40.0	16 0.9	13 59.9	16 17.7
18	9 53.0	14 54.0	11 18.7	15 33.1	12 41.7	16 1.4	14 1.5	16 17.9
20	9 54.8	14 54.9	11 20.4	15 33.8	12 43.4	16 1.9	14 3.1	16 18.1
22	9 56.6	14 55.8	11 22.2	15 34.5	12 45.0	16 2.3	14 4.7	16 18.3
H. D.	0.9	0.5	0.9	0.4	0.9	0.2	0.8	0.1
	Tuesday 19.		Saturday 23.		Wednesday 27.		Sunday 31.	
0	−9 58.4	+14 56.7	−11 24.0	+15 35.2	−12 46.7	+16 2.8	−14 6.4	+16 18.5
2	10 0.2	14 57.6	11 25.7	15 35.8	12 48.4	16 3.2	14 8.0	16 18.7
4	10 2.0	14 58.5	11 27.5	15 36.5	12 50.1	16 3.7	14 9.6	16 18.9
6	10 3.8	14 59.4	11 29.2	15 37.2	12 51.8	16 4.1	14 11.2	16 19.1
8	10 5.6	15 0.3	11 31.0	15 37.9	12 53.5	16 4.6	14 12.8	16 19.3
10	10 7.4	15 1.2	11 32.7	15 38.6	12 55.2	16 5.0	14 14.4	16 19.4
12	10 9.2	15 2.1	11 34.5	15 39.2	12 56.9	16 5.4	14 16.1	16 19.6
14	10 11.0	15 3.0	11 36.2	15 39.9	12 58.6	16 5.8	14 17.7	16 19.8
16	10 12.8	15 3.8	11 38.0	15 40.5	13 0.2	16 6.3	14 19.3	16 19.9
18	10 14.6	15 4.7	11 39.7	15 41.2	13 1.9	16 6.7	14 20.9	16 20.1
20	10 16.4	15 5.6	11 41.4	15 41.8	13 3.6	16 7.1	14 22.5	16 20.2
22	10 18.2	15 6.4	11 43.2	15 42.5	13 5.3	16 7.5	−14 24.1	+16 20.4
H. D.	0.9	0.4	0.9	0.3	0.8	0.2	0.8	0.1
	Wednesday 20.		Sunday 24.		Thursday 28.			
0	−10 20.0	+15 7.3	−11 44.9	+15 43.1	−13 7.0	+16 7.9		
2	10 21.8	15 8.1	11 46.7	15 43.7	13 8.6	16 8.3		
4	10 23.6	15 9.0	11 48.4	15 44.4	13 10.3	16 8.7		
6	10 25.4	15 9.8	11 50.1	15 45.0	13 12.0	16 9.0		
8	10 27.2	15 10.7	11 51.9	15 45.6	13 13.7	16 9.4		
10	10 29.0	15 11.5	11 53.6	15 46.2	13 15.3	16 9.8		
12	10 30.8	15 12.3	11 55.4	15 46.8	13 17.0	16 10.1		
14	10 32.6	15 13.2	11 57.1	15 47.4	13 18.7	16 10.5		
16	10 34.4	15 14.0	11 58.8	15 48.0	13 20.3	16 10.8		
18	10 36.2	15 14.8	12 0.5	15 48.6	13 22.0	16 11.2		
20	10 37.9	15 15.6	12 2.3	15 49.2	13 23.7	16 11.5		
22	−10 39.7	+15 16.4	−12 4.0	+15 49.8	−13 25.3	+16 11.9		
H. D.	0.9	0.4	0.9	0.3	0.8	0.2		

SEMIDIAMETER.

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Oct. 1	16.01
11	16.06
21	16.10
31	16.15

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Monday 1.		Friday 5.		Tuesday 9.		Saturday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−14 25.7	+16 20.5	−15 40.8	+16 20.0	−16 51.7	+16 6.1	−17 58.0	+15 38.5
2	14 27.3	16 20.6	15 42.3	16 19.9	16 53.1	16 5.6	17 59.3	15 37.8
4	14 28.9	16 20.7	15 43.8	16 19.7	16 54.5	16 5.2	18 0.6	15 37.1
6	14 30.5	16 20.9	15 45.3	16 19.6	16 55.9	16 4.8	18 2.0	15 36.3
8	14 32.1	16 21.0	15 46.8	16 19.4	16 57.4	16 4.3	18 3.3	15 35.6
10	14 33.7	16 21.1	15 48.3	16 19.2	16 58.8	16 3.8	18 4.6	15 34.9
12	14 35.3	16 21.2	15 49.9	16 19.0	17 0.2	16 3.4	18 5.9	15 34.1
14	14 36.9	16 21.3	15 51.4	16 18.8	17 1.6	16 2.9	18 7.2	15 33.4
16	14 38.5	16 21.3	15 52.9	16 18.7	17 3.0	16 2.4	18 8.5	15 32.6
18	14 40.1	16 21.4	15 54.4	16 18.5	17 4.4	16 1.9	18 9.9	15 31.8
20	14 41.7	16 21.5	15 55.9	16 18.3	17 5.9	16 1.5	18 11.2	15 31.1
22	14 43.2	16 21.6	15 57.4	16 18.0	17 7.3	16 1.0	18 12.5	15 30.3
H. D.	0.8	0.0	0.8	0.1	0.7	0.2	0.7	0.4
	Tuesday 2.		Saturday 6.		Wednesday 10.		Sunday 14.	
0	−14 44.8	+16 21.6	−15 58.9	+16 17.8	−17 8.7	+16 0.5	−18 13.8	+15 29.5
2	14 46.4	16 21.7	16 0.4	16 17.6	17 10.1	15 59.9	18 15.1	15 28.7
4	14 48.0	16 21.7	16 1.9	16 17.4	17 11.5	15 59.4	18 16.4	15 27.9
6	14 49.6	16 21.8	16 3.4	16 17.1	17 12.9	15 58.9	18 17.7	15 27.1
8	14 51.2	16 21.8	16 4.9	16 16.9	17 14.3	15 58.4	18 19.0	15 26.3
10	14 52.7	16 21.9	16 6.4	16 16.7	17 15.7	15 57.9	18 20.3	15 25.5
12	14 54.3	16 21.9	16 7.8	16 16.4	17 17.1	15 57.3	18 21.6	15 24.7
14	14 55.9	16 21.9	16 9.3	16 16.1	17 18.5	15 56.8	18 22.9	15 23.9
16	14 57.4	16 21.9	16 10.8	16 15.9	17 19.9	15 56.2	18 24.1	15 23.1
18	14 59.0	16 21.9	16 12.3	16 15.6	17 21.3	15 55.7	18 25.4	15 22.2
20	15 0.6	16 21.9	16 13.8	16 15.3	17 22.6	15 55.1	18 26.7	15 21.4
22	15 2.2	16 21.9	16 15.3	16 15.1	17 24.0	15 54.6	18 28.0	15 20.5
H. D.	0.8	0.0	0.7	0.1	0.7	0.3	0.6	0.4
	Wednesday 3.		Sunday 7.		Thursday 11.		Monday 15.	
0	−15 3.7	+16 21.9	−16 16.7	+16 14.8	−17 25.4	+15 54.0	−18 29.3	+15 19.7
2	15 5.3	16 21.9	16 18.2	16 14.5	17 26.8	15 53.4	18 30.6	15 18.8
4	15 6.8	16 21.9	16 19.7	16 14.2	17 28.2	15 52.8	18 31.8	15 18.0
6	15 8.4	16 21.9	16 21.2	16 13.9	17 29.6	15 52.2	18 33.1	15 17.1
8	15 10.0	16 21.9	16 22.6	16 13.6	17 30.9	15 51.6	18 34.4	15 16.2
10	15 11.5	16 21.8	16 24.1	16 13.2	17 32.3	15 51.0	18 35.6	15 15.3
12	15 13.1	16 21.8	16 25.6	16 12.9	17 33.7	15 50.4	18 36.9	15 14.5
14	15 14.6	16 21.7	16 27.0	16 12.6	17 35.0	15 49.8	18 38.2	15 13.6
16	15 16.2	16 21.7	16 28.5	16 12.2	17 36.4	15 49.2	18 39.4	15 12.7
18	15 17.7	16 21.6	16 30.0	16 11.9	17 37.8	15 48.6	18 40.7	15 11.8
20	15 19.3	16 21.6	16 31.4	16 11.6	17 39.1	15 47.9	18 41.9	15 10.9
22	15 20.8	16 21.5	16 32.9	16 11.2	17 40.5	15 47.3	18 43.2	15 9.9
H. D.	0.8	0.0	0.7	0.2	0.7	0.3	0.6	0.4
	Thursday 4.		Monday 8.		Friday 12.		Tuesday 16.	
0	−15 22.4	+16 21.4	−16 34.3	+16 10.8	−17 41.8	+15 46.7	−18 44.4	+15 9.0
2	15 23.9	16 21.3	16 35.8	16 10.5	17 43.2	15 46.0	18 45.7	15 8.1
4	15 25.4	16 21.2	16 37.2	16 10.1	17 44.5	15 45.4	18 46.9	15 7.2
6	15 27.0	16 21.1	16 38.7	16 9.7	17 45.9	15 44.7	18 48.2	15 6.2
8	15 28.5	16 21.0	16 40.1	16 9.4	17 47.2	15 44.0	18 49.4	15 5.3
10	15 30.1	16 20.9	16 41.6	16 9.0	17 48.6	15 43.4	18 50.7	15 4.3
12	15 31.6	16 20.8	16 43.0	16 8.6	17 49.9	15 42.7	18 51.9	15 3.4
14	15 33.1	16 20.7	16 44.5	16 8.2	17 51.3	15 42.0	18 53.1	15 2.4
16	15 34.6	16 20.6	16 45.9	16 7.8	17 52.6	15 41.3	18 54.4	15 1.5
18	15 36.2	16 20.5	16 47.4	16 7.3	17 54.0	15 40.6	18 55.6	15 0.5
20	15 37.7	16 20.3	16 48.8	16 6.9	17 55.3	15 39.9	18 56.8	14 59.5
22	−15 39.2	+16 20.2	−16 50.2	+16 6.5	−17 56.6	+15 39.2	−18 58.0	+14 58.5
H. D.	0.8	0.1	0.7	0.2	0.7	0.3	0.6	0.5

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Wednesday 17.		Sunday 21.		Thursday 25.		Monday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−18 59.3	+14 57.5	−19 55.1	+14 3.5	−20 45.2	+12 56.9	−21 29.0	+11 38.4
2	19 0.5	14 56.5	19 56.2	14 2.3	20 46.2	12 55.4	21 29.9	11 36.6
4	19 1.7	14 55.5	19 57.3	14 1.0	20 47.1	12 53.9	21 30.7	11 34.8
6	19 2.9	14 54.5	19 58.4	13 59.7	20 48.1	12 52.4	21 31.6	11 33.1
8	19 4.1	14 53.5	19 59.5	13 58.4	20 49.1	12 50.8	21 32.4	11 31.3
10	19 5.4	14 52.5	20 0.6	13 57.2	20 50.0	12 49.3	21 33.2	11 29.5
12	19 6.6	14 51.5	20 1.7	13 55.9	20 51.0	12 47.8	21 34.1	11 27.7
14	19 7.8	14 50.5	20 2.8	13 54.6	20 52.0	12 46.2	21 34.9	11 26.0
16	19 9.0	14 49.4	20 3.9	13 53.3	20 52.9	12 44.7	21 35.7	11 24.2
18	19 10.2	14 48.4	20 5.0	13 52.0	20 53.9	12 43.1	21 36.5	11 22.4
20	19 11.4	14 47.3	20 6.1	13 50.7	20 54.8	12 41.5	21 37.4	11 20.6
22	19 12.6	14 46.3	20 7.1	13 49.3	20 55.8	12 40.0	21 38.2	11 18.8
H. D.	0.6	0.5	0.5	0.6	0.5	0.8	0.4	0.9
	Thursday 18.		Monday 22.		Friday 26.		Tuesday 30.	
0	−19 13.8	+14 45.2	−20 8.2	+13 48.0	−20 56.7	+12 38.4	−21 39.0	+11 16.9
2	19 15.0	14 44.2	20 9.3	13 46.7	20 57.7	12 36.8	21 39.8	11 15.1
4	19 16.1	14 43.1	20 10.4	13 45.4	20 58.6	12 35.2	21 40.6	11 13.3
6	19 17.3	14 42.0	20 11.4	13 44.0	20 59.6	12 33.6	21 41.4	11 11.5
8	19 18.5	14 41.0	20 12.5	13 42.7	21 0.5	12 32.1	21 42.2	11 9.6
10	19 19.7	14 39.9	20 13.5	13 41.3	21 1.4	12 30.5	21 43.0	11 7.8
12	19 20.9	14 38.8	20 14.6	13 40.0	21 2.4	12 28.8	21 43.8	11 6.0
14	19 22.1	14 37.7	20 15.7	13 38.6	21 3.3	12 27.2	21 44.6	11 4.1
16	19 23.2	14 36.6	20 16.7	13 37.3	21 4.2	12 25.6	21 45.4	11 2.3
18	19 24.4	14 35.5	20 17.8	13 35.9	21 5.2	12 24.0	21 46.2	11 0.4
20	19 25.6	14 34.4	20 18.8	13 34.5	21 6.1	12 22.4	21 47.0	10 58.6
22	19 26.7	14 33.2	20 19.9	13 33.1	21 7.0	12 20.7	−21 47.8	+10 56.7
H. D.	0.6	0.5	0.5	0.7	0.5	0.8	0.4	0.9
	Friday 19.		Tuesday 23.		Saturday 27.			
0	−19 27.9	+14 32.1	−20 20.9	+13 31.8	−21 7.9	+12 19.1		
2	19 29.1	14 31.0	20 22.0	13 30.4	21 8.8	12 17.5		
4	19 30.2	14 29.9	20 23.0	13 29.0	21 9.7	12 15.8		
6	19 31.4	14 28.7	20 24.0	13 27.6	21 10.6	12 14.2		
8	19 32.6	14 27.6	20 25.1	13 26.2	21 11.5	12 12.5		
10	19 33.7	14 26.4	20 26.1	13 24.8	21 12.4	12 10.8		
12	19 34.9	14 25.3	20 27.1	13 23.3	21 13.3	12 9.2		
14	19 36.0	14 24.1	20 28.2	13 21.9	21 14.2	12 7.5		
16	19 37.1	14 22.9	20 29.2	13 20.5	21 15.1	12 5.8		
18	19 38.3	14 21.8	20 30.2	13 19.1	21 16.0	12 4.2		
20	19 39.4	14 20.6	20 31.2	13 17.6	21 16.9	12 2.5		
22	19 40.6	14 19.4	20 32.2	13 16.2	21 17.8	12 0.8		
H. D.	0.6	0.6	0.5	0.7	0.4	0.8		
	Saturday 20.		Wednesday 24.		Sunday 28.			
0	−19 41.7	+14 18.2	−20 33.2	+13 14.7	−21 18.7	+11 59.1		
2	19 42.8	14 17.0	20 34.3	13 13.3	21 19.6	11 57.4		
4	19 44.0	14 15.8	20 35.3	13 11.8	21 20.4	11 55.7		
6	19 45.1	14 14.6	20 36.3	13 10.4	21 21.3	11 54.0		
8	19 46.2	14 13.4	20 37.3	13 8.9	21 22.2	11 52.3		
10	19 47.3	14 12.2	20 38.3	13 7.4	21 23.0	11 50.5		
12	19 48.5	14 11.0	20 39.3	13 5.9	21 23.9	11 48.8		
14	19 49.6	14 9.7	20 40.3	13 4.4	21 24.8	11 47.1		
16	19 50.7	14 8.5	20 41.2	13 3.0	21 25.6	11 45.4		
18	19 51.8	14 7.3	20 42.2	13 1.5	21 26.5	11 43.6		
20	19 52.9	14 6.0	20 43.2	13 0.0	21 27.3	11 41.9		
22	−19 54.0	+14 4.8	−20 44.2	+12 58.4	−21 28.2	+11 40.1		
H. D.	0.6	0.6	0.5	0.7	0.4	0.9		

SEMIDIAMETER.

	′
Nov. 1	16.15
11	16.19
21	16.23
Dec. 1	16.26

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Wednesday 1.		Sunday 5.		Thursday 9.		Monday 13.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−21 48.6	+10 54.8	−22 22.5	+9 19.9	−22 49.5	+7 36.0	−23 9.3	+5 44.9
2	21 49.3	10 53.0	22 23.1	9 17.9	22 50.0	7 33.7	23 9.7	5 42.6
4	21 50.1	10 51.1	22 23.8	9 15.8	22 50.5	7 31.5	23 10.0	5 40.2
6	21 50.9	10 49.2	22 24.4	9 13.7	22 51.0	7 29.2	23 10.3	5 37.8
8	21 51.6	10 47.3	22 25.0	9 11.6	22 51.4	7 27.0	23 10.6	5 35.4
10	21 52.4	10 45.4	22 25.6	9 9.5	22 51.9	7 24.7	23 11.0	5 33.0
12	21 53.2	10 43.5	22 26.3	9 7.4	22 52.4	7 22.4	23 11.3	5 30.6
14	21 53.9	10 41.6	22 26.9	9 5.3	22 52.9	7 20.2	23 11.6	5 28.3
16	21 54.7	10 39.7	22 27.5	9 3.2	22 53.3	7 17.9	23 11.9	5 25.9
18	21 55.4	10 37.8	22 28.1	9 1.1	22 53.8	7 15.6	23 12.2	5 23.5
20	21 56.2	10 35.9	22 28.7	8 59.0	22 54.2	7 13.4	23 12.5	5 21.1
22	21 56.9	10 34.0	22 29.3	8 56.8	22 54.7	7 11.1	23 12.8	5 18.7
H. D.	0.4	0.9	0.3	1.1	0.2	1.1	0.2	1.2
	Thursday 2.		Monday 6.		Friday 10.		Tuesday 14.	
0	−21 57.7	+10 32.0	−22 29.9	+8 54.7	−22 55.1	+7 8.8	−23 13.1	+5 16.3
2	21 58.4	10 30.1	22 30.5	8 52.6	22 55.6	7 6.5	23 13.4	5 13.9
4	21 59.2	10 28.2	22 31.1	8 50.5	22 56.0	7 4.2	23 13.7	5 11.5
6	21 59.9	10 26.2	22 31.7	8 48.3	22 56.5	7 1.9	23 14.0	5 9.1
8	22 0.6	10 24.3	22 32.3	8 46.2	22 56.9	6 59.6	23 14.3	5 6.7
10	22 1.4	10 22.4	22 32.9	8 44.1	22 57.4	6 57.3	23 14.6	5 4.3
12	22 2.1	10 20.4	22 33.5	8 41.9	22 57.8	6 55.0	23 14.9	5 1.9
14	22 2.8	10 18.5	22 34.0	8 39.8	22 58.2	6 52.7	23 15.1	4 59.5
16	22 3.5	10 16.5	22 34.6	8 37.6	22 58.7	6 50.4	23 15.4	4 57.1
18	22 4.2	10 14.5	22 35.2	8 35.5	22 59.1	6 48.1	23 15.7	4 54.7
20	22 5.0	10 12.6	22 35.8	8 33.3	22 59.5	6 45.8	23 16.0	4 52.2
22	22 5.7	10 10.6	22 36.3	8 31.1	22 59.9	6 43.5	23 16.2	4 49.8
H. D.	0.4	1.0	0.3	1.1	0.2	1.1	0.1	1.2
	Friday 3.		Tuesday 7.		Saturday 11.		Wednesday 15.	
0	−22 6.4	+10 8.6	−22 36.9	+8 29.0	−23 0.3	+6 41.2	−23 16.5	+4 47.4
2	22 7.1	10 6.6	22 37.5	8 26.8	23 0.7	6 38.9	23 16.7	4 45.0
4	22 7.8	10 4.7	22 38.0	8 24.6	23 1.1	6 36.6	23 17.0	4 42.6
6	22 8.5	10 2.7	22 38.6	8 22.5	23 1.5	6 34.2	23 17.2	4 40.1
8	22 9.2	10 0.7	22 39.1	8 20.3	23 1.9	6 31.9	23 17.5	4 37.7
10	22 9.9	9 58.7	22 39.7	8 18.1	23 2.3	6 29.6	23 17.7	4 35.3
12	22 10.6	9 56.7	22 40.2	8 15.9	23 2.7	6 27.3	23 18.0	4 32.9
14	22 11.3	9 54.7	22 40.8	8 13.7	23 3.1	6 24.9	23 18.2	4 30.4
16	22 11.9	9 52.7	22 41.3	8 11.5	23 3.5	6 22.6	23 18.4	4 28.0
18	22 12.6	9 50.6	22 41.8	8 9.3	23 3.9	6 20.3	23 18.7	4 25.6
20	22 13.3	9 48.6	22 42.4	8 7.1	23 4.3	6 17.9	23 18.9	4 23.1
22	22 14.0	9 46.6	22 42.9	8 4.9	23 4.7	6 15.6	23 19.1	4 20.7
H. D.	0.3	1.0	0.3	1.1	0.2	1.2	0.1	1.2
	Saturday 4.		Wednesday 8.		Sunday 12.		Thursday 16.	
0	−22 14.7	+ 9 44.6	−22 43.4	+8 2.7	−23 5.1	+6 13.2	−23 19.4	+4 18.3
2	22 15.3	9 42.5	22 43.9	8 0.5	23 5.4	6 10.9	23 19.6	4 15.8
4	22 16.0	9 40.5	22 44.5	7 58.3	23 5.8	6 8.5	23 19.8	4 13.4
6	22 16.7	9 38.5	22 45.0	7 56.1	23 6.2	6 6.2	23 20.0	4 10.9
8	22 17.3	9 36.4	22 45.5	7 53.9	23 6.5	6 3.8	23 20.2	4 8.5
10	22 18.0	9 34.4	22 46.0	7 51.6	23 6.9	6 1.5	23 20.4	4 6.1
12	22 18.6	9 32.3	22 46.5	7 49.4	23 7.2	5 59.1	23 20.6	4 3.6
14	22 19.3	9 30.3	22 47.0	7 47.2	23 7.6	5 56.8	23 20.8	4 1.2
16	22 19.9	9 28.2	22 47.5	7 44.9	23 7.9	5 54.4	23 21.0	3 58.7
18	22 20.6	9 26.2	22 48.0	7 42.7	23 8.3	5 52.0	23 21.2	3 56.3
20	22 21.2	9 24.1	22 48.5	7 40.5	23 8.6	5 49.7	23 21.4	3 53.8
22	−22 21.9	+ 9 22.0	−22 49.0	+7 38.2	−23 9.0	+5 47.3	−23 21.6	+3 51.4
H. D.	0.3	1.0	0.3	1.1	0.2	1.2	0.1	1.2

NOTE.—The Equation of Time is to be applied to the G. M. T in accordance with the sign as given.

G. M. T.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.	Sun's Declination.	Equation of Time.
	Friday 17.		Tuesday 21.		Saturday 25.		Wednesday 29.	
h	° ′	m s	° ′	m s	° ′	m s	° ′	m s
0	−23 21.8	+3 48.9	−23 26.7	+1 50.2	−23 24.2	−0 9.1	−23 14.1	−2 7.1
2	23 22.0	3 46.5	23 26.8	1 47.7	23 24.1	0 11.6	23 13.8	2 9.5
4	23 22.1	3 44.0	23 26.8	1 45.2	23 23.9	0 14.1	23 13.5	2 11.9
6	23 22.3	3 41.5	23 26.8	1 42.7	23 23.8	0 16.5	23 13.2	2 14.4
8	23 22.5	3 39.1	23 26.8	1 40.2	23 23.6	0 19.0	23 12.9	2 16.8
10	23 22.6	3 36.6	23 26.8	1 37.8	23 23.5	0 21.5	23 12.6	2 19.2
12	23 22.8	3 34.2	23 26.8	1 35.3	23 23.3	0 24.0	23 12.3	2 21.6
14	23 23.0	3 31.7	23 26.8	1 32.8	23 23.2	0 26.4	23 12.0	2 24.1
16	23 23.1	3 29.3	23 26.8	1 30.3	23 23.0	0 28.9	23 11.7	2 26.5
18	23 23.3	3 26.8	23 26.8	1 27.8	23 22.9	0 31.4	23 11.4	2 28.9
20	23 23.4	3 24.3	23 26.8	1 25.3	23 22.7	0 33.9	23 11.1	2 31.3
22	23 23.6	3 21.9	23 26.8	1 22.8	23 22.5	0 36.3	23 10.7	2 33.7
H. D.	0.1	1.2	0.0	1.2	0.1	1.2	0.2	1.2
	Saturday 18.		Wednesday 22.		Sunday 26.		Thursday 30.	
0	−23 23.7	+3 19.4	−23 26.8	+1 20.3	−23 22.4	−0 38.8	−23 10.4	−2 36.1
2	23 23.9	3 16.9	23 26.8	1 17.8	23 22.2	0 41.3	23 10.1	2 38.6
4	23 24.0	3 14.5	23 26.8	1 15.4	23 22.0	0 43.7	23 9.7	2 41.0
6	23 24.1	3 12.0	23 26.7	1 12.9	23 21.8	0 46.2	23 9.4	2 43.4
8	23 24.3	3 9.5	23 26.7	1 10.4	23 21.7	0 48.7	23 9.1	2 45.8
10	23 24.4	3 7.1	23 26.7	1 7.9	23 21.5	0 51.1	23 8.7	2 48.2
12	23 24.5	3 4.6	23 26.7	1 5.4	23 21.3	0 53.6	23 8.4	2 50.6
14	23 24.6	3 2.1	23 26.6	1 2.9	23 21.1	0 56.1	23 8.0	2 53.0
16	23 24.8	2 59.6	23 26.6	1 0.4	23 20.9	0 58.5	23 7.7	2 55.4
18	23 24.9	2 57.2	23 26.5	0 57.9	23 20.7	1 1.0	23 7.3	2 57.8
20	23 25.0	2 54.7	23 26.5	0 55.5	23 20.5	1 3.5	23 7.0	3 0.2
22	23 25.1	2 52.2	23 26.5	0 53.0	23 20.3	1 5.9	23 6.6	3 2.6
H. D.	0.1	1.2	0.0	1.2	0.1	1.2	0.2	1.2
	Sunday 19.		Thursday 23.		Monday 27.		Friday 31.	
0	−23 25.2	+2 49.8	−23 26.4	+0 50.5	−23 20.1	−1 8.4	−23 6.3	−3 5.0
2	23 25.3	2 47.3	23 26.3	0 48.0	23 19.9	1 10.8	23 5.9	3 7.4
4	23 25.4	2 44.8	23 26.3	0 45.5	23 19.6	1 13.3	23 5.5	3 9.8
6	23 25.5	2 42.3	23 26.2	0 43.0	23 19.4	1 15.7	23 5.1	3 12.1
8	23 25.6	2 39.8	23 26.2	0 40.5	23 19.2	1 18.2	23 4.8	3 14.5
10	23 25.7	2 37.4	23 26.1	0 38.1	23 18.9	1 20.7	23 4.4	3 16.9
12	23 25.8	2 34.9	23 26.0	0 35.6	23 18.8	1 23.1	23 4.0	3 19.3
14	23 25.8	2 32.4	23 25.9	0 33.1	23 18.5	1 25.6	23 3.6	3 21.7
16	23 25.9	2 29.9	23 25.9	0 30.6	23 18.3	1 28.0	23 3.2	3 24.1
18	23 26.0	2 27.5	23 25.8	0 28.1	23 18.1	1 30.5	23 2.8	3 26.4
20	23 26.1	2 25.0	23 25.7	0 25.6	23 17.8	1 32.9	23 2.4	3 28.8
22	23 26.1	2 22.5	23 25.6	0 23.1	23 17.6	1 35.4	−23 2.0	−3 31.2
H. D.	0.0	1.2	0.0	1.2	0.1	1.2	0.2	1.2
	Monday 20.		Friday 24.		Tuesday 28.			
0	−23 26.2	+2 20.0	−23 25.5	+0 20.7	−23 17.3	−1 37.8		
2	23 26.3	2 17.5	23 25.4	0 18.2	23 17.1	1 40.3		
4	23 26.3	2 15.0	23 25.3	0 15.7	23 16.8	1 42.7		
6	23 26.4	2 12.6	23 25.2	0 13.2	23 16.6	1 45.1		
8	23 26.4	2 10.1	23 25.1	0 10.7	23 16.3	1 47.6		
10	23 26.5	2 7.6	23 25.0	0 8.2	23 16.0	1 50.0		
12	23 26.5	2 5.1	23 24.9	0 5.8	23 15.8	1 52.5		
14	23 26.6	2 2.6	23 24.8	0 3.3	23 15.5	1 54.9		
16	23 26.6	2 0.1	23 24.7	+0 0.8	23 15.2	1 57.3		
18	23 26.7	1 57.6	23 24.6	−0 1.7	23 14.9	1 59.8		
20	23 26.7	1 55.2	23 24.4	0 4.2	23 14.7	2 2.2		
22	−23 26.7	+1 52.7	−23 24.3	−0 6.6	−23 14.4	−2 4.6		
H. D.	0.0	1.2	0.1	1.2	0.1	1.2		

SEMIDIAMETER.	
Dec. 1	16.26
11	16.28
21	16.29
31	16.30

NOTE.—The Equation of Time is to be applied to the G. M. T. in accordance with the sign as given.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	January 1.					
h	h m s		° ′		′	″
0	2 25 31	292	+15 48.8	169	16.3	59.8
2	2 30 23	293	16 5.7	164	16.3	59.8
4	2 35 16	294	16 22.1	161	16.3	59.9
6	2 40 10	296	16 38.2	157	16.4	59.9
8	2 45 6	298	16 53.9	153	16.4	60.0
10	2 50 4	298	17 9.2	149	16.4	60.0
12	2 55 2	300	17 24.1	144	16.4	60.1
14	3 0 2	301	17 38.5	139	16.4	60.1
16	3 5 3	303	17 52.4	136	16.4	60.2
18	3 10 6	304	18 6.0	130	16.4	60.2
20	3 15 10	305	18 19.0	126	16.5	60.3
22	3 20 15	307	18 31.6	120	16.5	60.3
	January 2.					
0	3 25 22	307	+18 43.6	116	16.5	60.4
2	3 30 29	309	18 55.2	111	16.5	60.4
4	3 35 38	310	19 6.3	105	16.5	60.5
6	3 40 48	311	19 16.8	100	16.5	60.5
8	3 45 59	312	19 26.8	95	16.5	60.5
10	3 51 11	314	19 36.3	89	16.5	60.6
12	3 56 25	314	19 45.2	84	16.5	60.6
14	4 1 39	315	19 53.6	78	16.6	60.7
16	4 6 54	316	20 1.4	72	16.6	60.7
18	4 12 10	317	20 8.6	66	16.6	60.7
20	4 17 27	318	20 15.2	61	16.6	60.8
22	4 22 45	318	20 21.3	55	16.6	60.8
	January 3.					
0	4 28 3	319	+20 26.8	48	16.6	60.8
2	4 33 22	320	20 31.6	43	16.6	60.8
4	4 38 42	320	20 35.9	37	16.6	60.9
6	4 44 2	321	20 39.6	30	16.6	60.9
8	4 49 23	321	20 42.6	24	16.6	60.9
10	4 54 44	322	20 45.0	19	16.6	60.9
12	5 0 6	322	20 46.9	11	16.6	60.9
14	5 5 28	322	20 48.0	6	16.6	60.9
16	5 10 50	322	20 48.6	0	16.6	61.0
18	5 16 12	322	20 48.6	7	16.6	61.0
20	5 21 34	323	20 47.9	13	16.6	61.0
22	5 26 57	322	20 46.6	20	16.6	61.0
	January 4.					
0	5 32 19	322	+20 44.6	25	16.6	61.0
2	5 37 41	322	20 42.1	32	16.6	61.0
4	5 43 3	322	20 38.9	38	16.6	61.0
6	5 48 25	322	20 35.1	44	16.6	61.0
8	5 53 47	321	20 30.7	51	16.6	61.0
10	5 59 8	321	20 25.6	56	16.6	61.0
12	6 4 29	320	20 20.0	63	16.6	61.0
14	6 9 49	320	20 13.7	68	16.6	61.0
16	6 15 9	319	20 6.9	75	16.6	60.9
18	6 20 28	318	19 59.4	80	16.6	60.9
20	6 25 46	318	19 51.4	86	16.6	60.9
22	6 31 4	316	19 42.8	92	16.6	60.9
24	6 36 20		+19 33.6		16.6	60.9
	January 5.					
0	6 36 20	316	+19 33.6	98	16.6	60.9
2	6 41 36	316	19 23.8	103	16.6	60.8
4	6 46 52	314	19 13.5	109	16.6	60.8
6	6 52 6	313	19 2.6	114	16.6	60.8
8	6 57 19	312	18 51.2	119	16.6	60.8
10	7 2 31	311	18 39.3	124	16.6	60.7
12	7 7 42	310	18 26.9	130	16.6	60.7
14	7 12 52	309	18 13.9	135	16.6	60.7
16	7 18 1	307	18 0.4	139	16.5	60.6
18	7 23 8	307	17 46.5	144	16.5	60.6
20	7 28 15	305	17 32.1	149	16.5	60.5
22	7 33 20	304	17 17.2	154	16.5	60.5
	January 6.					
0	7 38 24	302	+17 1.8	158	16.5	60.5
2	7 43 26	301	16 46.0	162	16.5	60.4
4	7 48 27	300	16 29.8	166	16.5	60.4
6	7 53 27	298	16 13.2	171	16.5	60.3
8	7 58 25	297	15 56.1	174	16.4	60.2
10	8 3 22	296	15 38.7	178	16.4	60.2
12	8 8 18	294	15 20.9	182	16.4	60.1
14	8 13 12	293	15 2.7	185	16.4	60.1
16	8 18 5	291	14 44.2	189	16.4	60.0
18	8 22 56	290	14 25.3	192	16.4	60.0
20	8 27 46	288	14 6.1	195	16.3	59.9
22	8 32 34	287	13 46.6	198	16.3	59.8
	January 7.					
0	8 37 21	286	+13 26.8	202	16.3	59.8
2	8 42 7	284	13 6.6	203	16.3	59.7
4	8 46 51	283	12 46.3	207	16.3	59.7
6	8 51 34	281	12 25.6	209	16.3	59.6
8	8 56 15	280	12 4.7	212	16.2	59.5
10	9 0 55	278	11 43.5	213	16.2	59.5
12	9 5 33	277	11 22.2	216	16.2	59.4
14	9 10 10	276	11 0.6	218	16.2	59.3
16	9 14 46	274	10 38.8	220	16.2	59.2
18	9 19 20	273	10 16.8	222	16.1	59.2
20	9 23 53	272	9 54.6	223	16.1	59.1
22	9 28 25	270	9 32.3	225	16.1	59.0
	January 8.					
0	9 32 55	269	+ 9 9.8	227	16.1	58.9
2	9 37 24	268	8 47.1	227	16.1	58.9
4	9 41 52	266	8 24.4	229	16.0	58.8
6	9 46 18	266	8 1.5	230	16.0	58.7
8	9 50 44	264	7 38.5	232	16.0	58.6
10	9 55 8	262	7 15.3	232	16.0	58.6
12	9 59 30	262	6 52.1	233	16.0	58.5
14	10 3 52	261	6 28.8	233	15.9	58.4
16	10 8 13	259	6 5.5	234	15.9	58.3
18	10 12 32	258	5 42.1	235	15.9	58.2
20	10 16 50	258	5 18.6	235	15.9	58.2
22	10 21 8	256	4 55.1	236	15.9	58.1
24	10 25 24		+ 4 31.5		15.8	58.0

Full Moon, Jan. 5d 9h 5m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	January 9.					
h	h m s		° ′		′	″
0	10 25 24	255	+ 4 31.5	235	15.8	58.0
2	10 29 39	254	4 8.0	236	15.8	57.9
4	10 33 58	253	3 44.4	236	15.8	57.8
6	10 38 6	253	3 20.8	236	15.8	57.8
8	10 42 19	251	2 57.2	236	15.7	57.7
10	10 46 30	251	2 33.6	236	15.7	57.6
12	10 50 41	249	2 10.0	235	15.7	57.5
14	10 54 50	249	1 46.5	235	15.7	57.5
16	10 58 59	248	1 23.0	235	15.7	57.4
18	11 3 7	248	0 59.5	234	15.6	57.3
20	11 7 15	246	0 36.1	234	15.6	57.2
22	11 11 21	246	+ 0 12.7	233	15.6	57.2
	January 10.					
0	11 15 27	245	− 0 10.6	232	15.6	57.1
2	11 19 32	245	0 33.8	232	15.6	57.0
4	11 23 37	244	0 57.0	231	15.5	56.9
6	11 27 41	243	1 20.1	229	15.5	56.8
8	11 31 44	243	1 43.0	229	15.5	56.8
10	11 35 47	242	2 5.9	228	15.5	56.7
12	11 39 49	242	2 28.7	227	15.5	56.6
14	11 43 51	241	2 51.4	226	15.4	56.6
16	11 47 52	241	3 14.0	224	15.4	56.5
18	11 51 53	240	3 36.4	223	15.4	56.4
20	11 55 53	240	3 58.7	222	15.4	56.3
22	11 59 53	240	4 20.9	221	15.4	56.3
	January 11.					
0	12 3 53	239	− 4 43.0	219	15.3	56.2
2	12 7 52	239	5 4.9	218	15.3	56.1
4	12 11 51	239	5 26.7	216	15.3	56.1
6	12 15 50	238	5 48.3	215	15.3	56.0
8	12 19 48	238	6 9.8	213	15.3	55.9
10	12 23 46	238	6 31.1	211	15.3	55.9
12	12 27 44	238	6 52.2	210	15.2	55.8
14	12 31 42	237	7 13.2	207	15.2	55.8
16	12 35 39	237	7 33.9	207	15.2	55.7
18	12 39 36	238	7 54.6	204	15.2	55.6
20	12 43 34	237	8 15.0	202	15.2	55.6
22	12 47 31	237	8 35.2	201	15.2	55.5
	January 12.					
0	12 51 28	237	− 8 55.3	198	15.1	55.5
2	12 55 25	237	9 15.1	196	15.1	55.4
4	12 59 22	237	9 34.7	195	15.1	55.4
6	13 3 19	237	9 54.2	192	15.1	55.3
8	13 7 16	237	10 13.4	190	15.1	55.3
10	13 11 13	237	10 32.4	188	15.1	55.2
12	13 15 10	237	10 51.2	186	15.1	55.1
14	13 19 7	237	11 9.8	183	15.0	55.1
16	13 23 4	237	11 28.1	181	15.0	55.1
18	13 27 1	238	11 46.2	179	15.0	55.0
20	13 30 59	237	12 4.1	176	15.0	55.0
22	13 34 56	238	12 21.7	174	15.0	54.9
24	13 38 54		−12 39.1		15.0	54.9

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	January 13.					
h	h m s		° ′		′	″
0	13 38 54	238	−12 39.1	172	15.0	54.9
2	13 42 52	238	12 56.3	169	15.0	54.8
4	13 46 50	238	13 13.2	166	15.0	54.8
6	13 50 48	239	13 29.8	164	14.9	54.7
8	13 54 47	238	13 46.2	162	14.9	54.7
10	13 58 45	239	14 2.4	158	14.9	54.7
12	14 2 44	240	14 18.2	156	14.9	54.6
14	14 6 44	239	14 33.8	153	14.9	54.6
16	14 10 43	240	14 49.1	151	14.9	54.6
18	14 14 43	240	15 4.2	148	14.9	54.5
20	14 18 43	240	15 19.0	145	14.9	54.5
22	14 22 43	241	15 33.5	142	14.9	54.5
	January 14.					
0	14 26 44	241	−15 47.7	139	14.9	54.4
2	14 30 45	242	16 1.6	136	14.9	54.4
4	14 34 47	241	16 15.2	133	14.8	54.4
6	14 38 48	242	16 28.5	131	14.8	54.4
8	14 42 50	243	16 41.6	127	14.8	54.3
10	14 46 53	243	16 54.3	124	14.8	54.3
12	14 50 56	243	17 6.7	121	14.8	54.3
14	14 54 59	243	17 18.8	118	14.8	54.3
16	14 59 2	244	17 30.6	115	14.8	54.2
18	15 3 6	244	17 42.1	111	14.8	54.2
20	15 7 10	245	17 53.2	109	14.8	54.2
22	15 11 15	245	18 4.1	105	14.8	54.2
	January 15.					
0	15 15 20	246	−18 14.6	102	14.8	54.2
2	15 19 26	245	18 24.8	98	14.8	54.2
4	15 23 31	247	18 34.6	95	14.8	54.2
6	15 27 38	246	18 44.1	92	14.8	54.1
8	15 31 44	247	18 53.3	89	14.8	54.1
10	15 35 51	248	19 2.2	85	14.8	54.1
12	15 39 59	247	19 10.7	81	14.8	54.1
14	15 44 6	249	19 18.8	78	14.8	54.1
16	15 48 15	248	19 26.6	75	14.8	54.1
18	15 52 23	249	19 34.1	71	14.8	54.1
20	15 56 32	249	19 41.2	67	14.8	54.1
22	16 0 41	250	19 47.9	64	14.8	54.1
	January 16.					
0	16 4 51	250	−19 54.3	60	14.8	54.1
2	16 9 1	250	20 0.3	57	14.8	54.1
4	16 13 11	251	20 6.0	52	14.8	54.1
6	16 17 22	251	20 11.2	50	14.8	54.1
8	16 21 33	251	20 16.2	45	14.8	54.1
10	16 25 44	251	20 20.7	42	14.8	54.1
12	16 29 55	252	20 24.9	38	14.8	54.1
14	16 34 7	253	20 28.7	34	14.8	54.1
16	16 38 20	252	20 32.1	31	14.8	54.1
18	16 42 32	253	20 35.2	26	14.8	54.1
20	16 46 45	253	20 37.8	23	14.8	54.1
22	16 50 58	253	20 40.1	19	14.8	54.1
24	16 55 11		−20 42.0		14.8	54.1

Last Quarter, Jan. 12d 12h 9m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	January 17.					
h	h m s		° ′	′	′	′
0	16 55 11	253	−20 42.0	16	14.8	54.1
2	16 59 24	254	20 43.6	11	14.8	54.1
4	17 3 38	254	20 44.7	8	14.8	54.1
6	17 7 52	254	20 45.5	3	14.8	54.1
8	17 12 6	254	20 45.8	0	14.8	54.2
10	17 16 20	254	20 45.8	4	14.8	54.2
12	17 20 34	255	20 45.4	8	14.8	54.2
14	17 24 49	254	20 44.6	12	14.8	54.2
16	17 29 3	255	20 43.4	15	14.8	54.2
18	17 33 18	255	20 41.9	20	14.8	54.2
20	17 37 33	256	20 39.9	24	14.8	54.2
22	17 41 48	255	20 37.5	27	14.8	54.3
	January 18.					
0	17 46 3	255	−20 34.8	31	14.8	54.3
2	17 50 18	255	20 31.7	36	14.8	54.3
4	17 54 33	255	20 28.1	39	14.8	54.3
6	17 58 48	255	20 24.2	43	14.8	54.3
8	18 3 3	255	20 19.9	47	14.8	54.4
10	18 7 18	255	20 15.2	50	14.8	54.4
12	18 11 33	255	20 10.2	55	14.8	54.4
14	18 15 48	255	20 4.7	59	14.9	54.4
16	18 20 3	254	19 58.8	62	14.9	54.4
18	18 24 17	255	19 52.6	66	14.9	54.5
20	18 28 32	255	19 46.0	70	14.9	54.5
22	18 32 47	254	19 39.0	74	14.9	54.5
	January 19.					
0	18 37 1	255	−19 31.6	77	14.9	54.5
2	18 41 16	254	19 23.9	81	14.9	54.6
4	18 45 30	254	19 15.8	85	14.9	54.6
6	18 49 44	254	19 7.3	89	14.9	54.6
8	18 53 58	254	18 58.4	93	14.9	54.6
10	18 58 12	253	18 49.1	96	14.9	54.7
12	19 2 25	254	18 39.5	99	14.9	54.7
14	19 6 39	253	18 29.6	104	14.9	54.7
16	19 10 52	253	18 19.2	106	14.9	54.8
18	19 15 5	252	18 8.6	111	15.0	54.8
20	19 19 17	253	17 57.5	114	15.0	54.8
22	19 23 30	252	17 46.1	117	15.0	54.9
	January 20.					
0	19 27 42	252	−17 34.4	121	15.0	54.9
2	19 31 54	252	17 22.3	124	15.0	54.9
4	19 36 6	251	17 9.9	128	15.0	54.9
6	19 40 17	251	16 57.1	131	15.0	55.0
8	19 44 28	251	16 44.0	134	15.0	55.0
10	19 48 39	251	16 30.6	138	15.0	55.0
12	19 52 50	250	16 16.8	140	15.0	55.1
14	19 57 0	250	16 2.8	144	15.0	55.1
16	20 1 10	250	15 48.4	147	15.1	55.1
18	20 5 20	249	15 33.7	151	15.1	55.2
20	20 9 29	250	15 18.6	153	15.1	55.2
22	20 13 39	249	15 3.3	156	15.1	55.2
24	20 17 48		−14 47.7		15.1	55.3

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	January 21.					
h	h m s		° ′	′	′	′
0	20 17 48	248	−14 47.7	159	15.1	55.3
2	20 21 56	248	14 31.8	162	15.1	55.3
4	20 26 4	248	14 15.6	165	15.1	55.3
6	20 30 12	248	13 59.1	168	15.1	55.4
8	20 34 20	248	13 42.3	171	15.1	55.4
10	20 38 28	247	13 25.2	173	15.1	55.5
12	20 42 35	247	13 7.9	176	15.1	55.5
14	20 46 42	246	12 50.3	178	15.2	55.5
16	20 50 48	247	12 32.5	181	15.2	55.6
18	20 54 55	246	12 14.4	184	15.2	55.6
20	20 59 1	246	11 56.0	186	15.2	55.6
22	21 3 7	245	11 37.4	188	15.2	55.7
	January 22.					
0	21 7 12	246	−11 18.6	191	15.2	55.7
2	21 11 18	245	10 59.5	193	15.2	55.8
4	21 15 23	245	10 40.2	195	15.2	55.8
6	21 19 28	245	10 20.7	197	15.2	55.8
8	21 23 33	244	10 1.0	200	15.2	55.9
10	21 27 37	245	9 41.0	201	15.3	55.9
12	21 31 42	244	9 20.9	204	15.3	55.9
14	21 35 46	244	9 0.5	205	15.3	56.0
16	21 39 50	244	8 40.0	207	15.3	56.0
18	21 43 54	244	8 19.3	209	15.3	56.1
20	21 47 58	244	7 58.4	211	15.3	56.1
22	21 52 2	243	7 37.3	213	15.3	56.1
	January 23.					
0	21 56 5	244	− 7 16.0	214	15.3	56.2
2	22 0 9	243	6 54.6	215	15.3	56.2
4	22 4 12	244	6 33.1	217	15.4	56.3
6	22 8 16	243	6 11.4	219	15.4	56.3
8	22 12 19	244	5 49.5	220	15.4	56.3
10	22 16 23	243	5 27.5	221	15.4	56.4
12	22 20 26	244	5 5.4	222	15.4	56.4
14	22 24 30	243	4 43.2	224	15.4	56.5
16	22 28 33	244	4 20.8	224	15.4	56.5
18	22 32 37	244	3 58.4	226	15.4	56.5
20	22 36 41	244	3 35.8	227	15.4	56.6
22	22 40 45	244	3 13.1	227	15.5	56.6
	January 24.					
0	22 44 49	244	− 2 50.4	228	15.5	56.7
2	22 48 53	244	2 27.6	230	15.5	56.7
4	22 52 57	245	2 4.6	229	15.5	56.7
6	22 57 2	244	1 41.7	231	15.5	56.8
8	23 1 6	245	1 18.6	230	15.5	56.8
10	23 5 11	246	0 55.6	232	15.5	56.9
12	23 9 17	245	0 32.4	231	15.5	56.9
14	23 13 22	246	− 0 9.3	233	15.5	57.0
16	23 17 28	246	+ 0 14.0	232	15.6	57.0
18	23 21 34	247	0 37.2	232	15.6	57.0
20	23 25 41	247	1 0.4	233	15.6	57.1
22	23 29 48	247	1 23.7	232	15.6	57.1
24	23 33 55		+ 1 46.9		15.6	57.2

New Moon, Jan. 20d 17h 27m.

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	January 25.					
h	h m s		° ′	′	′	′
0	23 33 55	248	+ 1 46.9	233	15.6	57.2
2	23 38 3	246	2 10.2	232	15.6	57.2
4	23 42 11	249	2 33.4	233	15.6	57.3
6	23 46 20	249	2 56.7	232	15.6	57.3
8	23 50 29	250	3 19.9	231	15.7	57.3
10	23 54 39	250	3 43.0	231	15.7	57.4
12	23 58 49	251	4 6.1	231	15.7	57.4
14	0 3 0	252	4 29.2	230	15.7	57.5
16	0 7 12	252	4 52.2	229	15.7	57.5
18	0 11 24	253	5 15.1	229	15.7	57.6
20	0 15 37	253	5 38.0	228	15.7	57.6
22	0 19 50	255	6 0.8	227	15.7	57.6
	January 26.					
0	0 24 5	255	+ 6 23.5	226	15.7	57.7
2	0 28 20	255	6 46.1	224	15.8	57.7
4	0 32 35	257	7 8.5	224	15.8	57.8
6	0 36 52	257	7 30.9	223	15.8	57.8
8	0 41 9	258	7 53.2	221	15.8	57.9
10	0 45 27	259	8 15.3	219	15.8	57.9
12	0 49 46	260	8 37.2	218	15.8	58.0
14	0 54 6	261	8 59.0	217	15.8	58.0
16	0 58 27	261	9 20.7	215	15.8	58.0
18	1 2 48	263	9 42.2	213	15.9	58.1
20	1 7 11	263	10 3.5	211	15.9	58.1
22	1 11 34	265	10 24.6	209	15.9	58.2
	January 27.					
0	1 15 59	265	+10 45.5	207	15.9	58.2
2	1 20 24	267	11 6.2	205	15.9	58.3
4	1 24 51	267	11 26.7	203	15.9	58.3
6	1 29 18	269	11 47.0	201	15.9	58.4
8	1 33 47	269	12 7.1	198	15.9	58.4
10	1 38 16	271	12 26.9	195	16.0	58.4
12	1 42 47	272	12 46.4	193	16.0	58.5
14	1 47 19	273	13 5.7	191	16.0	58.5
16	1 51 52	274	13 24.8	187	16.0	58.6
18	1 56 26	275	13 43.5	185	16.0	58.6
20	2 1 1	276	14 2.0	181	16.0	58.7
22	2 5 37	277	14 20.1	179	16.0	58.7
	January 28.					
0	2 10 14	279	+14 38.0	175	16.0	58.7
2	2 14 53	279	14 55.5	172	16.0	58.8
4	2 19 32	281	15 12.7	169	16.1	58.8
6	2 24 13	282	15 29.6	165	16.1	58.9
8	2 28 55	283	15 46.1	162	16.1	58.9
10	2 33 38	285	16 2.3	158	16.1	59.0
12	2 38 23	285	16 18.1	154	16.1	59.0
14	2 43 8	287	16 33.5	151	16.1	59.0
16	2 47 55	288	16 48.6	146	16.1	59.1
18	2 52 43	289	17 3.2	143	16.1	59.1
20	2 57 32	290	17 17.5	138	16.1	59.2
22	3 2 22	291	17 31.3	134	16.2	59.2
24	3 7 13		+17 44.7		16.2	59.2

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	January 29.					
h	h m s		° ′	′	′	′
0	3 7 13	292	+17 44.7	130	16.2	59.2
2	3 12 5	294	17 57.7	125	16.2	59.3
4	3 16 59	294	18 10.2	121	16.2	59.3
6	3 21 53	296	18 22.3	116	16.2	59.4
8	3 26 49	297	18 33.9	112	16.2	59.4
10	3 31 46	297	18 45.1	107	16.2	59.4
12	3 36 43	299	18 55.8	102	16.2	59.5
14	3 41 42	300	19 6.0	97	16.2	59.5
16	3 46 42	300	19 15.7	93	16.2	59.5
18	3 51 42	302	19 25.0	87	16.3	59.6
20	3 56 44	302	19 33.7	82	16.3	59.6
22	4 1 46	303	19 41.9	77	16.3	59.6
	January 30.					
0	4 6 49	305	+19 49.6	71	16.3	59.7
2	4 11 54	304	19 56.7	67	16.3	59.7
4	4 16 58	306	20 3.4	61	16.3	59.7
6	4 22 4	307	20 9.5	55	16.3	59.8
8	4 27 11	307	20 15.0	50	16.3	59.8
10	4 32 18	307	20 20.0	45	16.3	59.8
12	4 37 25	309	20 24.5	39	16.3	59.8
14	4 42 34	308	20 28.4	33	16.3	59.9
16	4 47 42	310	20 31.7	27	16.3	59.9
18	4 52 52	309	20 34.4	22	16.3	59.9
20	4 58 1	311	20 36.6	16	16.4	59.9
22	5 3 12	310	20 38.2	11	16.4	60.0
	January 31.					
0	5 8 22	311	+20 39.3	5	16.4	60.0
2	5 13 33	311	20 39.8	— 2	16.4	60.0
4	5 18 44	311	20 39.6	7	16.4	60.0
6	5 23 55	312	20 38.9	12	16.4	60.0
8	5 29 7	311	20 37.7	19	16.4	60.0
10	5 34 18	312	20 35.8	24	16.4	60.1
12	5 39 30	311	20 33.4	30	16.4	60.1
14	5 44 41	312	20 30.4	36	16.4	60.1
16	5 49 53	311	20 26.8	42	16.4	60.1
18	5 55 4	311	20 22.6	48	16.4	60.1
20	6 0 15	311	20 17.8	53	16.4	60.1
22	6 5 26	311	20 12.5	59	16.4	60.1
	February 1.					
0	6 10 37	310	+20 6.6	64	16.4	60.1
2	6 15 47	310	20 0.2	71	16.4	60.1
4	6 20 57	310	19 53.1	75	16.4	60.1
6	6 26 7	309	19 45.6	82	16.4	60.1
8	6 31 16	309	19 37.4	87	16.4	60.1
10	6 36 25	308	19 28.7	92	16.4	60.1
12	6 41 33	307	19 19.5	98	16.4	60.1
14	6 46 40	307	19 9.7	102	16.4	60.1
16	6 51 47	307	18 59.5	109	16.4	60.1
18	6 56 54	305	18 48.6	113	16.4	60.1
20	7 1 59	305	18 37.3	118	16.4	60.1
22	7 7 4	304	18 25.5	124	16.4	60.1
24	7 12 8		+18 13.1		16.4	60.1

First Quarter, Jan. 29d 3h 38m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	February 2.					
h	h m s		° ′		′	′
0	7 12 8	303	+18 13.1	128	16.4	60.1
2	7 17 11	302	18 0.3	133	16.4	60.0
4	7 22 13	301	17 47.0	138	16.4	60.0
6	7 27 14	301	17 33.2	142	16.4	60.0
8	7 32 15	299	17 19.0	147	16.4	60.0
10	7 37 14	298	17 4.3	152	16.4	60.0
12	7 42 12	298	16 49.1	156	16.4	60.0
14	7 47 10	296	16 33.5	160	16.4	59.9
16	7 52 6	296	16 17.5	164	16.3	59.9
18	7 57 2	294	16 1.1	168	16.3	59.9
20	8 1 56	293	15 44.3	172	16.3	59.9
22	8 6 49	292	15 27.1	176	16.3	59.8
	February 3.					
0	8 11 41	291	+15 9.5	180	16.3	59.8
2	8 16 32	290	14 51.5	183	16.3	59.8
4	8 21 22	289	14 33.2	187	16.3	59.7
6	8 26 11	288	14 14.5	190	16.3	59.7
8	8 30 59	286	13 55.5	194	16.3	59.6
10	8 35 45	286	13 36.1	196	16.3	59.6
12	8 40 31	284	13 16.5	200	16.3	59.6
14	8 45 15	283	12 56.5	202	16.2	59.5
16	8 49 58	282	12 36.3	205	16.2	59.5
18	8 54 40	280	12 15.8	208	16.2	59.4
20	8 59 20	280	11 55.0	211	16.2	59.4
22	9 4 0	279	11 33.9	213	16.2	59.4
	February 4.					
0	9 8 39	277	+11 12.6	215	16.2	59.3
2	9 13 16	276	10 51.1	217	16.2	59.3
4	9 17 52	275	10 29.4	219	16.2	59.2
6	9 22 27	274	10 7.5	222	16.1	59.2
8	9 27 1	273	9 45.3	223	16.1	59.1
10	9 31 34	272	9 23.0	225	16.1	59.1
12	9 36 6	270	9 0.5	226	16.1	59.0
14	9 40 36	270	8 37.9	229	16.1	58.9
16	9 45 6	269	8 15.0	229	16.1	58.9
18	9 49 35	267	7 52.1	231	16.1	58.8
20	9 54 2	267	7 29.0	232	16.0	58.8
22	9 58 29	265	7 5.8	233	16.0	58.7
	February 5.					
0	10 2 54	265	+ 6 42.5	234	16.0	58.7
2	10 7 19	263	6 19.1	235	16.0	58.6
4	10 11 42	263	5 55.6	235	16.0	58.5
6	10 16 5	261	5 32.1	236	16.0	58.5
8	10 20 26	261	5 8.5	237	15.9	58.4
10	10 24 47	260	4 44.8	238	15.9	58.3
12	10 29 7	259	4 21.0	237	15.9	58.3
14	10 33 26	258	3 57.3	238	15.9	58.2
16	10 37 44	257	3 33.5	238	15.9	58.2
18	10 42 1	257	3 9.7	238	15.9	58.1
20	10 46 18	256	2 45.9	238	15.8	58.0
22	10 50 34	255	2 22.1	238	15.8	58.0
24	10 54 49		+ 1 58.3		15.8	57.9

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	February 6.					
h	h m s		° ′		′	′
0	10 54 49	254	+ 1 58.3	238	15.8	57.9
2	10 59 3	253	1 34.5	238	15.8	57.8
4	11 3 16	253	1 10.7	237	15.8	57.7
6	11 7 29	252	0 47.0	237	15.7	57.7
8	11 11 41	252	+ 0 23.3	236	15.7	57.6
10	11 15 53	250	− 0 0.3	235	15.7	57.5
12	11 20 3	251	0 23.8	235	15.7	57.5
14	11 24 14	249	0 47.3	234	15.7	57.4
16	11 28 23	249	1 10.7	234	15.7	57.3
18	11 32 32	249	1 34.1	232	15.6	57.3
20	11 36 41	248	1 57.3	232	15.6	57.2
22	11 40 49	247	2 20.5	230	15.6	57.1
	February 7.					
0	11 44 56	247	− 2 43.5	229	15.6	57.1
2	11 49 3	247	3 6.4	228	15.6	57.0
4	11 53 10	246	3 29.2	227	15.5	56.9
6	11 57 16	246	3 51.9	225	15.5	56.9
8	12 1 22	246	4 14.4	224	15.5	56.8
10	12 5 28	245	4 36.8	223	15.5	56.7
12	12 9 33	244	4 59.1	221	15.5	56.7
14	12 13 37	245	5 21.2	219	15.4	56.6
16	12 17 42	244	5 43.1	218	15.4	56.5
18	12 21 46	244	6 4.9	217	15.4	56.5
20	12 25 50	243	6 26.6	214	15.4	56.4
22	12 29 53	244	6 48.0	213	15.4	56.3
	February 8.					
0	12 33 57	243	− 7 9.3	210	15.4	56.3
2	12 38 0	243	7 30.3	209	15.3	56.2
4	12 42 3	242	7 51.2	207	15.3	56.2
6	12 46 5	243	8 11.9	205	15.3	56.1
8	12 50 8	242	8 32.4	203	15.3	56.0
10	12 54 10	243	8 52.7	201	15.3	56.0
12	12 58 13	242	9 12.8	198	15.3	55.9
14	13 2 15	242	9 32.6	197	15.2	55.8
16	13 6 17	242	9 52.3	194	15.2	55.8
18	13 10 19	243	10 11.7	192	15.2	55.7
20	13 14 22	242	10 30.9	189	15.2	55.7
22	13 18 24	242	10 49.8	187	15.2	55.6
	February 9.					
0	13 22 26	242	−11 8.5	185	15.2	55.6
2	13 26 28	242	11 27.0	182	15.2	55.5
4	13 30 30	242	11 45.2	180	15.1	55.5
6	13 34 32	242	12 3.2	177	15.1	55.4
8	13 38 34	242	12 20.9	175	15.1	55.4
10	13 42 36	243	12 38.4	172	15.1	55.3
12	13 46 39	242	12 55.6	169	15.1	55.3
14	13 50 41	243	13 12.5	167	15.1	55.2
16	13 54 44	242	13 29.2	164	15.1	55.2
18	13 58 46	243	13 45.6	161	15.0	55.1
20	14 2 49	243	14 1.7	159	15.0	55.1
22	14 6 52	243	14 17.6	155	15.0	55.0
24	14 10 55	248	−14 33.1		15.0	55.0

Full Moon, Feb. 3d 20h 42m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	February 10.					
h	h m s		° ′		′	″
0	14 10 55	243	−14 33.1	153	15.0	55.0
2	14 14 58	244	14 48.4	150	15.0	54.9
4	14 19 2	243	15 3.4	146	15.0	54.9
6	14 23 5	244	15 18.0	144	15.0	54.9
8	14 27 9	244	15 32.4	141	15.0	54.8
10	14 31 13	244	15 46.5	138	15.0	54.8
12	14 35 17	245	16 0.3	135	14.9	54.7
14	14 39 22	244	16 13.8	131	14.9	54.7
16	14 43 26	245	16 26.9	129	14.9	54.7
18	14 47 31	245	16 39.8	125	14.9	54.6
20	14 51 36	246	16 52.3	122	14.9	54.6
22	14 55 42	245	17 4.5	119	14.9	54.6
	February 11.					
0	14 59 47	246	−17 16.4	116	14.9	54.5
2	15 3 53	246	17 28.0	112	14.9	54.5
4	15 7 59	247	17 39.2	109	14.9	54.5
6	15 12 6	246	17 50.1	106	14.9	54.5
8	15 16 12	247	18 0.7	103	14.9	54.4
10	15 20 19	247	18 11.0	99	14.9	54.4
12	15 24 26	248	18 20.9	95	14.8	54.4
14	15 28 34	247	18 30.4	93	14.8	54.4
16	15 32 41	248	18 39.7	88	14.8	54.3
18	15 36 49	249	18 48.5	86	14.8	54.3
20	15 40 58	248	18 57.1	82	14.8	54.3
22	15 45 6	249	19 5.3	78	14.8	54.3
	February 12.					
0	15 49 15	249	−19 13.1	75	14.8	54.3
2	15 53 24	249	19 20.6	71	14.8	54.3
4	15 57 33	250	19 27.7	68	14.8	54.3
6	16 1 43	250	19 34.5	64	14.8	54.2
8	16 5 53	250	19 40.9	60	14.8	54.2
10	16 10 3	250	19 46.9	57	14.8	54.2
12	16 14 13	250	19 52.6	53	14.8	54.2
14	16 18 23	251	19 57.9	50	14.8	54.2
16	16 22 34	251	20 2.9	46	14.8	54.2
18	16 26 45	251	20 7.5	42	14.8	54.2
20	16 30 56	252	20 11.7	38	14.8	54.2
22	16 35 8	252	20 15.5	35	14.8	54.2
	February 13.					
0	16 39 20	251	−20 19.0	31	14.8	54.2
2	16 43 31	252	20 22.1	27	14.8	54.2
4	16 47 43	253	20 24.8	23	14.8	54.2
6	16 51 56	252	20 27.1	20	14.8	54.2
8	16 56 8	253	20 29.1	16	14.8	54.2
10	17 0 21	253	20 30.7	12	14.8	54.2
12	17 4 34	252	20 31.9	8	14.8	54.2
14	17 8 46	254	20 32.7	4	14.8	54.2
16	17 13 0	253	20 33.1	1	14.8	54.2
18	17 17 13	253	20 33.2	−3	14.8	54.2
20	17 21 26	253	20 32.9	7	14.8	54.3
22	17 25 39	253	20 32.2	11	14.8	54.3
24	17 29 53	254	−20 31.1		14.8	54.3

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	February 14.					
h	h m s		° ′		′	″
0	17 29 53	254	−20 31.1	15	14.8	54.3
2	17 34 7	253	20 29.6	18	14.8	54.3
4	17 38 20	254	20 27.8	23	14.8	54.3
6	17 42 34	254	20 25.5	26	14.8	54.3
8	17 46 48	254	20 22.9	30	14.8	54.3
10	17 51 2	254	20 19.9	34	14.8	54.4
12	17 55 16	254	20 16.5	38	14.8	54.4
14	17 59 30	254	20 12.7	41	14.8	54.4
16	18 3 44	254	20 8.6	46	14.9	54.4
18	18 7 58	254	20 4.0	49	14.9	54.4
20	18 12 12	254	19 59.1	53	14.9	54.5
22	18 16 26	254	19 53.8	57	14.9	54.5
	February 15.					
0	18 20 40	254	−19 48.1	61	14.9	54.5
2	18 24 54	254	19 42.0	64	14.9	54.5
4	18 29 8	253	19 35.6	68	14.9	54.6
6	18 33 21	254	19 28.8	72	14.9	54.6
8	18 37 35	254	19 21.6	76	14.9	54.6
10	18 41 49	254	19 14.0	79	14.9	54.6
12	18 46 3	253	19 6.1	83	14.9	54.7
14	18 50 16	254	18 57.8	87	14.9	54.7
16	18 54 30	253	18 49.1	90	14.9	54.7
18	18 58 43	253	18 40.1	94	15.0	54.8
20	19 2 56	253	18 30.7	98	15.0	54.8
22	19 7 9	253	18 20.9	101	15.0	54.8
	February 16.					
0	19 11 22	253	−18 10.8	105	15.0	54.9
2	19 15 35	253	18 0.3	109	15.0	54.9
4	19 19 48	253	17 49.4	112	15.0	54.9
6	19 24 1	252	17 38.2	115	15.0	55.0
8	19 28 13	252	17 26.7	119	15.0	55.0
10	19 32 25	252	17 14.8	123	15.0	55.1
12	19 36 37	252	17 2.5	126	15.0	55.1
14	19 40 49	252	16 49.9	129	15.0	55.1
16	19 45 1	252	16 37.0	132	15.1	55.2
18	19 49 13	251	16 23.8	136	15.1	55.2
20	19 53 24	252	16 10.2	139	15.1	55.3
22	19 57 36	251	15 56.3	143	15.1	55.3
	February 17.					
0	20 1 47	251	−15 42.0	146	15.1	55.3
2	20 5 58	250	15 27.4	148	15.1	55.4
4	20 10 8	251	15 12.6	152	15.1	55.4
6	20 14 19	251	14 57.4	155	15.1	55.5
8	20 18 30	250	14 41.9	158	15.2	55.5
10	20 22 40	250	14 26.1	161	15.2	55.6
12	20 26 50	250	14 10.0	164	15.2	55.6
14	20 31 0	250	13 53.6	167	15.2	55.6
16	20 35 10	249	13 36.9	170	15.2	55.7
18	20 39 19	250	13 19.9	173	15.2	55.7
20	20 43 29	249	13 2.6	175	15.2	55.8
22	20 47 38	249	12 45.1	178	15.2	55.8
24	20 51 47		−12 27.3		15.2	55.9

Last Quarter, Feb. 11d 8h 49m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.	G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	February 18.							February 22.					
h	h m s		° ′		′	″	h	h m s		° ′		′	″
0	20 51 47	249	−12 27.3	181	15.2	55.9	0	0 11 53	258	+ 5 5.4	231	15.8	57.9
2	20 55 56	249	12 9.2	183	15.3	55.9	2	0 16 11	258	5 28.5	230	15.8	58.0
4	21 0 5	249	11 50.9	186	15.3	56.0	4	0 20 29	259	5 51.5	228	15.8	58.0
6	21 4 14	248	11 32.3	189	15.3	56.0	6	0 24 48	259	6 14.3	228	15.8	58.1
8	21 8 22	249	11 13.4	191	15.3	56.0	8	0 29 7	260	6 37.1	226	15.9	58.1
10	21 12 31	248	10 54.3	193	15.3	56.1	10	0 33 27	261	6 59.7	225	15.9	58.1
12	21 16 39	249	10 35.0	196	15.3	56.1	12	0 37 48	261	7 22.2	224	15.9	58.2
14	21 20 48	248	10 15.4	198	15.3	56.2	14	0 42 9	263	7 44.6	223	15.9	58.2
16	21 24 56	248	9 55.6	200	15.3	56.2	16	0 46 32	263	8 6.9	220	15.9	58.2
18	21 29 4	248	9 35.6	202	15.4	56.3	18	0 50 55	263	8 28.9	219	15.9	58.3
20	21 33 12	248	9 15.4	204	15.4	56.3	20	0 55 18	265	8 50.8	218	15.9	58.3
22	21 37 20	248	8 55.0	207	15.4	56.4	22	0 59 43	265	9 12.6	215	15.9	58.3
	February 19.							February 23.					
0	21 41 28	248	− 8 34.3	208	15.4	56.4	0	1 4 8	266	+ 9 34.1	214	15.9	58.3
2	21 45 36	248	8 13.5	211	15.4	56.5	2	1 8 34	267	9 55.5	212	15.9	58.4
4	21 49 44	248	7 52.4	212	15.4	56.5	4	1 13 1	268	10 16.7	209	15.9	58.4
6	21 53 52	248	7 31.2	214	15.4	56.6	6	1 17 29	268	10 37.6	207	15.9	58.4
8	21 58 0	248	7 9.8	216	15.5	56.6	8	1 21 57	269	10 58.3	205	16.0	58.5
10	22 2 8	248	6 48.2	217	15.5	56.6	10	1 26 26	271	11 18.8	203	16.0	58.5
12	22 6 16	248	6 26.5	219	15.5	56.7	12	1 30 57	271	11 39.1	200	16.0	58.5
14	22 10 24	248	6 4.6	220	15.5	56.7	14	1 35 28	271	11 59.1	197	16.0	58.5
16	22 14 32	248	5 42.6	222	15.5	56.8	16	1 39 59	273	12 18.8	195	16.0	58.6
18	22 18 40	248	5 20.4	223	15.5	56.8	18	1 44 32	274	12 38.3	192	16.0	58.6
20	22 22 48	249	4 58.1	225	15.5	56.9	20	1 49 6	275	12 57.5	189	16.0	58.6
22	22 26 57	248	4 35.6	226	15.5	56.9	22	1 53 41	275	13 16.4	187	16.0	58.6
	February 20.							February 24.					
0	22 31 5	249	− 4 13.0	227	15.5	57.0	0	1 58 16	277	+13 35.1	183	16.0	58.7
2	22 35 14	248	3 50.3	228	15.6	57.0	2	2 2 53	277	13 53.4	180	16.0	58.7
4	22 39 22	249	3 27.5	229	15.6	57.1	4	2 7 30	278	14 11.4	177	16.0	58.7
6	22 43 31	250	3 4.6	230	15.6	57.1	6	2 12 8	279	14 29.1	173	16.0	58.7
8	22 47 41	249	2 41.6	231	15.6	57.1	8	2 16 47	280	14 46.4	171	16.0	58.8
10	22 51 50	250	2 18.5	231	15.6	57.2	10	2 21 27	281	15 3.5	166	16.0	58.8
12	22 56 0	249	1 55.4	232	15.6	57.2	12	2 26 8	282	15 20.1	163	16.1	58.8
14	23 0 9	251	1 32.2	233	15.6	57.3	14	2 30 50	283	15 36.4	160	16.1	58.8
16	23 4 20	250	1 8.9	234	15.6	57.3	16	2 35 33	284	15 52.4	155	16.1	58.9
18	23 8 30	251	0 45.5	234	15.7	57.4	18	2 40 17	284	16 7.9	152	16.1	58.9
20	23 12 41	251	− 0 22.1	234	15.7	57.4	20	2 45 1	286	16 23.1	148	16.1	58.9
22	23 16 52	251	+ 0 1.3	234	15.7	57.4	22	2 49 47	286	16 37.9	144	16.1	58.9
	February 21.							February 25.					
0	23 21 3	252	+ 0 24.7	235	15.7	57.5	0	2 54 33	288	+16 52.3	140	16.1	58.9
2	23 25 15	252	0 48.2	235	15.7	57.5	2	2 59 21	288	17 6.3	135	16.1	59.0
4	23 29 27	252	1 11.7	235	15.7	57.6	4	3 4 9	289	17 19.8	132	16.1	59.0
6	23 33 39	253	1 35.2	235	15.7	57.6	6	3 8 58	290	17 33.0	127	16.1	59.0
8	23 37 52	254	1 58.7	235	15.7	57.6	8	3 13 48	290	17 45.7	123	16.1	59.0
10	23 42 6	254	2 22.2	234	15.7	57.7	10	3 18 38	292	17 58.0	118	16.1	59.0
12	23 46 20	254	2 45.6	234	15.8	57.7	12	3 23 30	292	18 9.8	114	16.1	59.0
14	23 50 34	255	3 9.0	234	15.8	57.8	14	3 28 22	293	18 21.2	109	16.1	59.1
16	23 54 49	255	3 32.4	234	15.8	57.8	16	3 33 15	294	18 32.1	104	16.1	59.1
18	23 59 4	256	3 55.8	233	15.8	57.8	18	3 38 9	294	18 42.5	100	16.1	59.1
20	0 3 20	256	4 19.1	232	15.8	57.9	20	3 43 3	296	18 52.5	95	16.1	59.1
22	0 7 36	257	4 42.3	231	15.8	57.9	22	3 47 59	296	19 2.0	90	16.1	59.1
24	0 11 53		+ 5 5.4		15.8	57.9	24	3 52 55		+19 11.0		16.1	59.1

New Moon, Feb. 19d 9h 35m.

G. M. T.	Right Ascension		Declination.		S. D.	H. P.
	February 26.					
h	h m s		° ′		′	′
0	3 52 55	296	+19 11.0	85	16.1	59.1
2	3 57 51	297	19 19.5	80	16.1	59.1
4	4 2 48	298	19 27.5	75	16.1	59.2
6	4 7 46	298	19 35.0	70	16.1	59.2
8	4 12 44	299	19 42.0	65	16.2	59.2
10	4 17 43	299	19 48.5	60	16.2	59.2
12	4 22 42	300	19 54.5	54	16.2	59.2
14	4 27 42	301	19 59.9	50	16.2	59.2
16	4 32 43	300	20 4.9	44	16.2	59.2
18	4 37 43	301	20 9.3	39	16.2	59.2
20	4 42 44	302	20 13.2	33	16.2	59.2
22	4 47 46	301	20 16.5	28	16.2	59.2
	February 27.					
0	4 52 47	302	+20 19.3	23	16.2	59.3
2	4 57 49	302	20 21.6	17	16.2	59.3
4	5 2 51	303	20 23.3	12	16.2	59.3
6	5 7 54	302	20 24.5	6	16.2	59.3
8	5 12 56	302	20 25.1	1	16.2	59.3
10	5 17 58	303	20 25.2	— 4	16.2	59.3
12	5 23 1	303	20 24.8	10	16.2	59.3
14	5 28 4	302	20 23.8	15	16.2	59.3
16	5 33 6	303	20 22.3	21	16.2	59.3
18	5 38 9	302	20 20.2	26	16.2	59.3
20	5 43 11	302	20 17.6	32	16.2	59.3
22	5 48 13	302	20 14.4	37	16.2	59.3
	February 28.					
0	5 53 15	302	+20 10.7	42	16.2	59.3
2	5 58 17	302	20 6.5	48	16.2	59.3
4	6 3 19	301	20 1.7	53	16.2	59.3
6	6 8 20	301	19 56.4	58	16.2	59.3
8	6 13 21	301	19 50.6	64	16.2	59.3
10	6 18 22	300	19 44.2	68	16.2	59.3
12	6 23 22	300	19 37.4	74	16.2	59.3
14	6 28 22	299	19 30.0	79	16.2	59.3
16	6 33 21	299	19 22.1	84	16.2	59.3
18	6 38 20	298	19 13.7	89	16.2	59.3
20	6 43 18	297	19 4.8	94	16.2	59.3
22	6 48 15	297	18 55.4	99	16.2	59.3
	February 29.					
0	6 53 12	297	+18 45.5	104	16.2	59.3
2	6 58 9	296	18 35.1	109	16.2	59.3
4	7 3 5	295	18 24.2	113	16.2	59.2
6	7 8 0	294	18 12.9	118	16.2	59.2
8	7 12 54	294	18 1.1	122	16.2	59.2
10	7 17 48	292	17 48.8	127	16.2	59.2
12	7 22 40	292	17 36.1	131	16.2	59.2
14	7 27 32	292	17 23.0	136	16.2	59.2
16	7 32 24	290	17 9.4	140	16.2	59.2
18	7 37 14	290	16 55.4	145	16.1	59.2
20	7 42 4	289	16 40.9	148	16.1	59.1
22	7 46 53	287	16 26.1	153	16.1	59.1
24	7 51 40		+16 10.8		16.1	59.1

G. M. T.	Right Ascension		Declination.		S. D.	H. P.
	March 1.					
h	h m s		° ′		′	′
0	7 51 40	288	+16 10.8	156	16.1	59.1
2	7 56 28	286	15 55.2	160	16.1	59.1
4	8 1 14	285	15 39.2	164	16.1	59.1
6	8 5 59	284	15 22.8	168	16.1	59.1
8	8 10 43	284	15 6.0	171	16.1	59.0
10	8 15 27	282	14 48.9	175	16.1	59.0
12	8 20 9	282	14 31.4	178	16.1	59.0
14	8 24 51	280	14 13.6	182	16.1	59.0
16	8 29 31	280	13 55.4	185	16.1	58.9
18	8 34 11	279	13 36.9	187	16.1	58.9
20	8 38 50	278	13 18.2	191	16.1	58.9
22	8 43 28	277	12 59.1	194	16.1	58.9
	March 2.					
0	8 48 5	276	+12 39.7	196	16.1	58.8
2	8 52 41	275	12 20.1	199	16.0	58.8
4	8 57 16	274	12 0.2	202	16.0	58.8
6	9 1 50	273	11 40.0	204	16.0	58.7
8	9 6 23	273	11 19.6	207	16.0	58.7
10	9 10 56	271	10 58.9	209	16.0	58.7
12	9 15 27	271	10 38.0	211	16.0	58.7
14	9 19 58	269	10 16.9	213	16.0	58.6
16	9 24 27	269	9 55.6	215	16.0	58.6
18	9 28 56	268	9 34.1	217	16.0	58.5
20	9 33 24	267	9 12.4	219	16.0	58.5
22	9 37 51	266	8 50.5	221	16.0	58.5
	March 3.					
0	9 42 17	265	+ 8 28.4	222	15.9	58.4
2	9 46 42	265	8 6.2	224	15.9	58.4
4	9 51 7	264	7 43.8	225	15.9	58.4
6	9 55 31	263	7 21.3	226	15.9	58.3
8	9 59 54	262	6 58.7	227	15.9	58.3
10	10 4 16	261	6 36.0	229	15.9	58.2
12	10 8 37	261	6 13.1	230	15.9	58.2
14	10 12 58	260	5 50.1	230	15.9	58.2
16	10 17 18	259	5 27.1	231	15.9	58.1
18	10 21 37	259	5 4.0	232	15.8	58.1
20	10 25 56	258	4 40.8	233	15.8	58.0
22	10 30 14	257	4 17.5	233	15.8	58.0
	March 4.					
0	10 34 31	256	+ 3 54.2	234	15.8	57.9
2	10 38 47	256	3 30.8	234	15.8	57.9
4	10 43 3	256	3 7.4	234	15.8	57.8
6	10 47 19	254	2 44.0	234	15.8	57.8
8	10 51 33	255	2 20.6	234	15.8	57.7
10	10 55 48	253	1 57.2	235	15.7	57.7
12	11 0 1	253	1 33.7	234	15.7	57.6
14	11 4 14	253	1 10.3	234	15.7	57.6
16	11 8 27	252	0 46.9	234	15.7	57.5
18	11 12 39	252	0 23.5	233	15.7	57.5
20	11 16 51	251	+ 0 0.2	233	15.7	57.4
22	11 21 2	251	− 0 23.1	233	15.7	57.4
24	11 25 13		− 0 46.4		15.6	57.3

First Quarter, Feb. 26d 11h 50m.
Full Moon, Mar. 4d 9h 13m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	March 5.					
h	h m s		° ′		′	″
0	11 25 13	250	− 0 46.4	232	15.6	57.3
2	11 29 23	250	1 9.6	231	15.6	57.3
4	11 33 33	249	1 32.7	230	15.6	57.2
6	11 37 42	249	1 55.7	230	15.6	57.2
8	11 41 51	249	2 18.7	229	15.6	57.1
10	11 46 0	249	2 41.6	227	15.6	57.1
12	11 50 9	248	3 4.3	227	15.6	57.0
14	11 54 17	248	3 27.0	225	15.5	57.0
16	11 58 25	247	3 49.5	225	15.5	56.9
18	12 2 32	248	4 12.0	223	15.5	56.8
20	12 6 40	247	4 34.3	221	15.5	56.8
22	12 10 47	247	4 56.4	221	15.5	56.7
	March 6.					
0	12 14 54	246	− 5 18.5	218	15.5	56.7
2	12 19 0	247	5 40.3	218	15.5	56.6
4	12 23 7	246	6 2.1	215	15.4	56.6
6	12 27 13	246	6 23.6	214	15.4	56.5
8	12 31 19	246	6 45.0	212	15.4	56.5
10	12 35 25	246	7 6.2	211	15.4	56.4
12	12 39 31	246	7 27.3	208	15.4	56.4
14	12 43 37	246	7 48.1	207	15.4	56.3
16	12 47 43	245	8 8.8	205	15.4	56.3
18	12 51 48	246	8 29.3	202	15.3	56.2
20	12 55 54	245	8 49.5	201	15.3	56.2
22	12 59 59	246	9 9.6	198	15.3	56.1
	March 7.					
0	13 4 5	245	− 9 29.4	197	15.3	56.0
2	13 8 10	246	9 49.1	193	15.3	56.0
4	13 12 16	245	10 8.4	192	15.3	55.9
6	13 16 21	246	10 27.6	190	15.3	55.9
8	13 20 27	245	10 46.6	186	15.2	55.8
10	13 24 32	246	11 5.2	185	15.2	55.8
12	13 28 38	245	11 23.7	182	15.2	55.7
14	13 32 43	246	11 41.9	179	15.2	55.7
16	13 36 49	245	11 59.8	177	15.2	55.6
18	13 40 54	246	12 17.5	174	15.2	55.6
20	13 45 0	246	12 34.9	172	15.2	55.5
22	13 49 6	246	12 52.1	169	15.1	55.5
	March 8.					
0	13 53 12	246	−13 9.0	166	15.1	55.4
2	13 57 18	246	13 25.6	163	15.1	55.4
4	14 1 24	246	13 41.9	161	15.1	55.4
6	14 5 30	247	13 58.0	157	15.1	55.3
8	14 9 37	246	14 13.7	155	15.1	55.3
10	14 13 43	247	14 29.2	151	15.1	55.2
12	14 17 50	247	14 44.3	149	15.1	55.2
14	14 21 57	247	14 59.2	146	15.0	55.1
16	14 26 4	247	15 13.8	142	15.0	55.1
18	14 30 11	247	15 28.0	140	15.0	55.0
20	14 34 18	248	15 42.0	136	15.0	55.0
22	14 38 26	247	15 55.6	133	15.0	55.0
24	14 42 33		−16 8.9		15.0	54.9

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	March 9.					
h	h m s		° ′		′	″
0	14 42 33	248	−16 8.9	131	15.0	54.9
2	14 46 41	248	16 22.0	126	15.0	54.9
4	14 50 49	248	16 34.6	124	15.0	54.9
6	14 54 57	248	16 47.0	120	15.0	54.8
8	14 59 5	249	16 59.0	117	15.0	54.8
10	15 3 14	248	17 10.7	114	14.9	54.7
12	15 7 22	249	17 22.1	110	14.9	54.7
14	15 11 31	249	17 33.1	107	14.9	54.7
16	15 15 40	249	17 43.8	103	14.9	54.7
18	15 19 49	250	17 54.1	100	14.9	54.6
20	15 23 59	249	18 4.1	97	14.9	54.6
22	15 28 8	250	18 13.8	93	14.9	54.6
	March 10.					
0	15 32 18	250	−18 23.1	90	14.9	54.5
2	15 36 28	250	18 32.1	86	14.9	54.5
4	15 40 38	250	18 40.7	82	14.9	54.5
6	15 44 48	250	18 48.9	79	14.9	54.5
8	15 48 58	250	18 56.8	76	14.9	54.5
10	15 53 8	251	19 4.4	71	14.9	54.4
12	15 57 19	251	19 11.5	68	14.9	54.4
14	16 1 30	251	19 18.3	65	14.8	54.4
16	16 5 41	251	19 24.8	61	14.8	54.4
18	16 9 52	251	19 30.9	57	14.8	54.4
20	16 14 3	251	19 36.6	54	14.8	54.3
22	16 18 14	252	19 42.0	50	14.8	54.3
	March 11.					
0	16 22 26	251	−19 47.0	46	14.8	54.3
2	16 26 37	252	19 51.6	42	14.8	54.3
4	16 30 49	252	19 55.8	39	14.8	54.3
6	16 35 1	252	19 59.7	35	14.8	54.3
8	16 39 13	252	20 3.2	32	14.8	54.3
10	16 43 25	252	20 6.4	27	14.8	54.3
12	16 47 37	252	20 9.1	24	14.8	54.3
14	16 51 49	252	20 11.5	20	14.8	54.3
16	16 56 1	252	20 13.5	17	14.8	54.3
18	17 0 13	252	20 15.2	12	14.8	54.2
20	17 4 25	253	20 16.4	9	14.8	54.2
22	17 8 38	252	20 17.3	5	14.8	54.2
	March 12.					
0	17 12 50	253	−20 17.8	1	14.8	54.2
2	17 17 3	252	20 17.9	2	14.8	54.2
4	17 21 15	252	20 17.7	6	14.8	54.3
6	17 25 27	253	20 17.1	10	14.8	54.3
8	17 29 40	252	20 16.1	14	14.8	54.3
10	17 33 52	253	20 14.7	18	14.8	54.3
12	17 38 5	252	20 12.9	21	14.8	54.3
14	17 42 17	252	20 10.8	25	14.8	54.3
16	17 46 29	253	20 8.3	29	14.8	54.3
18	17 50 42	252	20 5.4	32	14.8	54.3
20	17 54 54	252	20 2.2	37	14.8	54.3
22	17 59 6	253	19 58.5	40	14.8	54.3
24	18 3 19		−19 54.5		14.8	54.4

Last Quarter, Mar. 12d 5h 57m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	March 13.					
h	h m s		° ′	″	′	′
0	18 3 19	252	+19 54.5	43	14.8	54.4
2	18 7 31	252	19 50.2	48	14.8	54.4
4	18 11 43	252	19 45.4	51	14.8	54.4
6	18 15 55	252	19 40.3	55	14.9	54.4
8	18 20 7	252	19 34.8	59	14.9	54.4
10	18 24 19	252	19 28.9	62	14.9	54.5
12	18 28 31	251	19 22.7	66	14.9	54.5
14	18 32 42	252	19 16.1	69	14.9	54.5
16	18 36 54	251	19 9.2	73	14.9	54.5
18	18 41 5	252	19 1.9	77	14.9	54.6
20	18 45 17	251	18 54.2	81	14.9	54.6
22	18 49 28	251	18 46.1	84	14.9	54.6
	March 14.					
0	18 53 39	251	+18 37.7	87	14.9	54.6
2	18 57 50	251	18 29.0	91	14.9	54.7
4	19 2 1	251	18 19.9	95	14.9	54.7
6	19 6 12	251	18 10.4	98	14.9	54.7
8	19 10 23	250	18 0.6	102	14.9	54.8
10	19 14 33	251	17 50.4	105	15.0	54.8
12	19 18 44	250	17 39.9	109	15.0	54.8
14	19 22 54	250	17 29.0	112	15.0	54.9
16	19 27 4	250	17 17.8	115	15.0	54.9
18	19 31 14	250	17 6.3	119	15.0	55.0
20	19 35 24	250	16 54.4	122	15.0	55.0
22	19 39 34	249	16 42.2	125	15.0	55.0
	March 15.					
0	19 43 43	250	−16 29.7	129	15.0	55.1
2	19 47 53	249	16 16.8	132	15.0	55.1
4	19 52 2	250	16 3.6	135	15.1	55.2
6	19 56 12	249	15 50.1	139	15.1	55.2
8	20 0 21	249	15 36.2	141	15.1	55.2
10	20 4 30	249	15 22.1	145	15.1	55.3
12	20 8 39	249	15 7.6	148	15.1	55.3
14	20 12 48	248	14 52.8	151	15.1	55.4
16	20 16 56	249	14 37.7	154	15.1	55.4
18	20 21 5	249	14 22.3	156	15.1	55.5
20	20 25 14	248	14 6.7	160	15.2	55.5
22	20 29 22	249	13 50.7	163	15.2	55.6
	March 16.					
0	20 33 31	248	−13 34.4	166	15.2	55.6
2	20 37 39	248	13 17.8	168	15.2	55.7
4	20 41 47	248	13 1.0	172	15.2	55.7
6	20 45 55	249	12 43.8	174	15.2	55.8
8	20 50 4	248	12 26.4	177	15.2	55.8
10	20 54 12	248	12 8.7	179	15.3	55.9
12	20 58 20	248	11 50.8	182	15.3	56.0
14	21 2 28	248	11 32.6	185	15.3	56.0
16	21 6 36	248	11 14.1	187	15.3	56.1
18	21 10 44	248	10 55.4	190	15.3	56.1
20	21 14 52	249	10 36.4	192	15.3	56.2
22	21 19 1	248	10 17.2	194	15.3	56.2
24	21 23 9		− 9 57.8		15.4	56.3

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	March 17.					
h	h m s		° ′	″	′	′
0	21 23 9	248	− 9 57.8	197	15.4	56.3
2	21 27 17	248	9 38.1	199	15.4	56.4
4	21 31 25	249	9 18.2	202	15.4	56.4
6	21 35 34	248	8 58.0	203	15.4	56.5
8	21 39 42	249	8 37.7	206	15.4	56.5
10	21 43 51	249	8 17.1	207	15.4	56.6
12	21 48 0	249	7 56.4	210	15.5	56.7
14	21 52 9	249	7 35.4	212	15.5	56.7
16	21 56 18	249	7 14.2	213	15.5	56.8
18	22 0 27	249	6 52.9	216	15.5	56.8
20	22 4 36	250	6 31.3	217	15.5	56.9
22	22 8 46	249	6 9.6	218	15.5	56.9
	March 18.					
0	22 12 55	250	− 5 47.8	221	15.6	57.0
2	22 17 5	251	5 25.7	221	15.6	57.1
4	22 21 16	250	5 3.6	224	15.6	57.1
6	22 25 26	251	4 41.2	225	15.6	57.2
8	22 29 37	251	4 18.7	226	15.6	57.2
10	22 33 48	252	3 56.1	227	15.6	57.3
12	22 38 0	251	3 33.4	228	15.7	57.4
14	22 42 11	252	3 10.6	230	15.7	57.4
16	22 46 23	253	2 47.6	231	15.7	57.5
18	22 50 36	253	2 24.5	231	15.7	57.5
20	22 54 49	253	2 1.4	233	15.7	57.6
22	22 59 2	254	1 38.1	233	15.7	57.6
	March 19.					
0	23 3 16	254	− 1 14.8	234	15.8	57.7
2	23 7 30	254	0 51.4	235	15.8	57.8
4	23 11 44	255	0 27.9	235	15.8	57.8
6	23 15 59	256	− 0 4.4	236	15.8	57.9
8	23 20 15	256	+ 0 19.2	236	15.8	57.9
10	23 24 31	257	0 42.8	236	15.8	58.0
12	23 28 48	257	1 6.4	237	15.8	58.0
14	23 33 5	258	1 30.1	236	15.9	58.1
16	23 37 23	258	1 53.7	237	15.9	58.1
18	23 41 41	259	2 17.4	237	15.9	58.2
20	23 46 0	259	2 41.1	236	15.9	58.2
22	23 50 19	261	3 4.7	236	15.9	58.3
	March 20.					
0	23 54 40	260	+ 3 28.3	236	15.9	58.3
2	23 59 0	262	3 51.9	235	15.9	58.4
4	0 3 22	262	4 15.4	235	15.9	58.4
6	0 7 44	263	4 38.9	234	16.0	58.5
8	0 12 7	264	5 2.3	233	16.0	58.5
10	0 16 31	264	5 25.6	233	16.0	58.6
12	0 20 55	265	5 48.9	231	16.0	58.6
14	0 25 20	266	6 12.0	231	16.0	58.7
16	0 29 46	267	6 35.1	229	16.0	58.7
18	0 34 13	267	6 58.0	228	16.0	58.8
20	0 38 40	269	7 20.8	227	16.0	58.8
22	0 43 9	269	7 43.5	225	16.1	58.3
24	0 47 38		+ 8 6.0		16.1	58.9

New Moon, Mar. 19d 22h 56m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	March 21.					
h	h m s		° ′		′	′
0	0 47 38	270	+ 8 6.0	224	16.1	58.9
2	0 52 8	271	8 28.4	222	16.1	58.9
4	0 56 39	271	8 50.6	220	16.1	58.9
6	1 1 10	273	9 12.6	218	16.1	59.0
8	1 5 43	273	9 34.4	217	16.1	59.0
10	1 10 16	275	9 56.1	214	16.1	59.1
12	1 14 51	275	10 17.5	212	16.1	59.1
14	1 19 26	276	10 38.7	209	16.1	59.1
16	1 24 2	277	10 59.6	208	16.1	59.1
18	1 28 39	278	11 20.4	204	16.2	59.2
20	1 33 17	279	11 40.8	202	16.2	59.2
22	1 37 56	279	12 1.0	200	16.2	59.2
	March 22.					
0	1 42 35	281	+12 21.0	196	16.2	59.3
2	1 47 16	281	12 40.6	193	16.2	59.3
4	1 51 57	283	12 59.9	191	16.2	59.3
6	1 56 40	283	13 19.0	187	16.2	59.3
8	2 1 23	285	13 37.7	184	16.2	59.4
10	2 6 8	285	13 56.1	181	16.2	59.4
12	2 10 53	286	14 14.2	177	16.2	59.4
14	2 15 39	287	14 31.9	174	16.2	59.4
16	2 20 26	288	14 49.3	170	16.2	59.4
18	2 25 14	289	15 6.3	166	16.2	59.4
20	2 30 3	289	15 22.9	162	16.2	59.5
22	2 34 52	291	15 39.1	159	16.2	59.5
	March 23.					
0	2 39 43	291	+15 55.0	154	16.2	59.5
2	2 44 34	292	16 10.4	151	16.2	59.5
4	2 49 26	293	16 25.5	146	16.2	59.5
6	2 54 19	294	16 40.1	142	16.2	59.5
8	2 59 13	294	16 54.3	137	16.2	59.5
10	3 4 7	295	17 8.0	133	16.2	59.5
12	3 9 2	296	17 21.3	129	16.3	59.5
14	3 13 58	297	17 34.2	124	16.3	59.5
16	3 18 55	297	17 46.6	119	16.3	59.5
18	3 23 52	298	17 58.5	114	16.3	59.6
20	3 28 50	299	18 9.9	110	16.3	59.6
22	3 33 49	299	18 20.9	105	16.3	59.6
	March 24.					
0	3 38 48	299	+18 31.4	100	16.3	59.6
2	3 43 47	300	18 41.4	95	16.3	59.6
4	3 48 47	301	18 50.9	90	16.3	59.6
6	3 53 48	301	18 59.9	84	16.3	59.6
8	3 58 49	302	19 8.3	80	16.3	59.5
10	4 3 51	302	19 16.3	75	16.3	59.5
12	4 8 53	302	19 23.8	69	16.3	59.5
14	4 13 55	303	19 30.7	64	16.2	59.5
16	4 18 58	303	19 37.1	58	16.2	59.5
18	4 24 1	303	19 42.9	54	16.2	59.5
20	4 29 4	303	19 48.3	48	16.2	59.5
22	4 34 7	304	19 53.1	42	16.2	59.5
24	4 39 11		+19 57.3		16.2	59.5

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	March 25.					
h	h m s		° ′		′	′
0	4 39 11	303	+19 57.3	37	16.2	59.5
2	4 44 14	304	20 1.0	32	16.2	59.5
4	4 49 18	304	20 4.2	27	16.2	59.5
6	4 54 22	303	20 6.9	21	16.2	59.5
8	4 59 25	304	20 9.0	15	16.2	59.4
10	5 4 29	304	20 10.5	10	16.2	59.4
12	5 9 33	303	20 11.5	5	16.2	59.4
14	5 14 36	303	20 12.0	1	16.2	59.4
16	5 19 39	303	20 11.9	6	16.2	59.4
18	5 24 42	303	20 11.3	12	16.2	59.4
20	5 29 45	303	20 10.1	17	16.2	59.4
22	5 34 48	302	20 8.4	22	16.2	59.3
	March 26.					
0	5 39 50	302	+20 6.2	28	16.2	59.3
2	5 44 52	301	20 3.4	33	16.2	59.3
4	5 49 53	301	20 0.1	38	16.2	59.3
6	5 54 54	301	19 56.3	44	16.2	59.3
8	5 59 55	300	19 51.9	49	16.2	59.2
10	6 4 55	299	19 47.0	54	16.2	59.2
12	6 9 54	299	19 41.6	59	16.2	59.2
14	6 14 53	299	19 35.7	64	16.2	59.2
16	6 19 52	297	19 29.3	69	16.1	59.2
18	6 24 49	297	19 22.4	74	16.1	59.1
20	6 29 46	297	19 15.0	79	16.1	59.1
22	6 34 43	295	19 7.1	84	16.1	59.1
	March 27.					
0	6 39 38	295	+18 58.7	89	16.1	59.1
2	6 44 33	294	18 49.8	93	16.1	59.0
4	6 49 27	294	18 40.5	98	16.1	59.0
6	6 54 21	292	18 30.7	103	16.1	59.0
8	6 59 13	292	18 20.4	107	16.1	59.0
10	7 4 5	290	18 9.7	112	16.1	58.9
12	7 8 55	290	17 58.5	116	16.1	58.9
14	7 13 45	289	17 46.9	121	16.1	58.9
16	7 18 34	289	17 34.8	124	16.1	58.9
18	7 23 23	287	17 22.4	129	16.1	58.8
20	7 28 10	286	17 9.5	133	16.0	58.8
22	7 32 56	285	16 56.2	137	16.0	58.8
	March 28.					
0	7 37 41	285	+16 42.5	141	16.0	58.7
2	7 42 26	283	16 28.4	145	16.0	58.7
4	7 47 9	283	16 13.9	149	16.0	58.7
6	7 51 52	281	15 59.0	152	16.0	58.7
8	7 56 33	281	15 43.8	156	16.0	58.6
10	8 1 14	279	15 28.2	159	16.0	58.6
12	8 5 53	279	15 12.3	163	16.0	58.6
14	8 10 32	278	14 56.0	166	16.0	58.5
16	8 15 10	276	14 39.4	170	16.0	58.5
18	8 19 46	276	14 22.4	172	16.0	58.5
20	8 24 22	275	14 5.2	176	16.0	58.4
22	8 28 57	274	13 47.6	178	15.9	58.4
24	8 33 31		+13 29.8		15.9	58.4

First Quarter, Mar. 26d 18h 45m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	March 29.					
h	h m s		° ′	′	′	′
0	8 33 31	272	+13 29.8	182	15.9	58.4
2	8 38 3	272	13 11.6	184	15.9	58.4
4	8 42 35	271	12 53.2	187	15.9	58.3
6	8 47 6	270	12 34.5	190	15.9	58.3
8	8 51 36	269	12 15.5	192	15.9	58.3
10	8 56 5	269	11 56.3	195	15.9	58.2
12	9 0 34	267	11 36.8	197	15.9	58.2
14	9 5 1	266	11 17.1	199	15.9	58.2
16	9 9 27	266	10 57.2	202	15.9	58.1
18	9 13 53	264	10 37.0	204	15.9	58.1
20	9 18 17	264	10 16.6	205	15.8	58.0
22	9 22 41	263	9 56.1	208	15.8	58.0
	March 30.					
0	9 27 4	262	+ 9 35.3	209	15.8	58.0
2	9 31 26	262	9 14.4	211	15.8	57.9
4	9 35 48	260	8 53.3	213	15.8	57.9
6	9 40 8	260	8 32.0	214	15.8	57.9
8	9 44 28	259	8 10.6	216	15.8	57.8
10	9 48 47	259	7 49.0	217	15.8	57.8
12	9 53 6	257	7 27.3	219	15.8	57.8
14	9 57 23	257	7 5.4	220	15.8	57.7
16	10 1 40	256	6 43.4	221	15.7	57.7
18	10 5 56	256	6 21.3	221	15.7	57.6
20	10 10 12	255	5 59.2	223	15.7	57.6
22	10 14 27	254	5 36.9	224	15.7	57.6
	March 31.					
0	10 18 41	254	+ 5 14.5	225	15.7	57.5
2	10 22 55	253	4 52.0	225	15.7	57.5
4	10 27 8	253	4 29.5	226	15.7	57.4
6	10 31 21	252	4 6.9	226	15.7	57.4
8	10 35 33	251	3 44.3	227	15.7	57.4
10	10 39 44	251	3 21.6	227	15.6	57.3
12	10 43 55	251	2 58.9	228	15.6	57.3
14	10 48 6	250	2 36.1	228	15.6	57.3
16	10 52 16	249	2 13.3	228	15.6	57.2
18	10 56 25	249	1 50.5	228	15.6	57.2
20	11 0 34	249	1 27.7	228	15.6	57.1
22	11 4 43	248	1 4.9	227	15.6	57.1
	April 1.					
0	11 8 51	248	+ 0 42.2	228	15.6	57.1
2	11 12 59	248	+ 0 19.4	228	15.6	57.0
4	11 17 7	247	− 0 3.4	227	15.6	57.0
6	11 21 14	247	0 26.1	226	15.5	56.9
8	11 25 21	247	0 48.7	227	15.5	56.9
10	11 29 28	247	1 11.4	225	15.5	56.8
12	11 33 35	246	1 33.9	226	15.5	56.8
14	11 37 41	246	1 56.5	224	15.5	56.8
16	11 41 47	246	2 18.9	224	15.5	56.7
18	11 45 53	245	2 41.3	222	15.5	56.7
20	11 49 58	246	3 3.5	222	15.5	56.6
22	11 54 4	245	3 25.7	221	15.4	56.6
24	11 58 9		− 3 47.8		15.4	56.6

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	April 2.					
h	h m s		° ′	′	′	′
0	11 58 9	245	− 3 47.8	220	15.4	56.6
2	12 2 14	245	4 9.8	219	15.4	56.5
4	12 6 19	245	4 31.7	217	15.4	56.5
6	12 10 24	245	4 53.4	217	15.4	56.4
8	12 14 29	244	5 15.1	215	15.4	56.4
10	12 18 33	245	5 36.6	213	15.4	56.3
12	12 22 38	245	5 57.9	212	15.4	56.3
14	12 26 43	244	6 19.1	211	15.4	56.3
16	12 30 47	245	6 40.2	209	15.3	56.2
18	12 34 52	244	7 1.1	208	15.3	56.2
20	12 38 56	245	7 21.9	205	15.3	56.1
22	12 43 1	245	7 42.4	204	15.3	56.1
	April 3.					
0	12 47 6	244	− 8 2.8	202	15.3	56.0
2	12 51 10	245	8 23.0	201	15.3	56.0
4	12 55 15	245	8 43.1	198	15.3	56.0
6	12 59 20	245	9 2.9	196	15.3	55.9
8	13 3 25	244	9 22.5	194	15.3	55.9
10	13 7 29	245	9 41.9	193	15.2	55.8
12	13 11 34	246	10 1.2	190	15.2	55.8
14	13 15 40	245	10 20.2	187	15.2	55.8
16	13 19 45	245	10 38.9	186	15.2	55.7
18	13 23 50	246	10 57.5	183	15.2	55.7
20	13 27 56	245	11 15.8	181	15.2	55.6
22	13 32 1	246	11 33.9	178	15.2	55.6
	April 4.					
0	13 36 7	246	−11 51.7	176	15.2	55.5
2	13 40 13	246	12 9.3	173	15.2	55.5
4	13 44 19	247	12 26.6	171	15.1	55.5
6	13 48 26	246	12 43.7	168	15.1	55.4
8	13 52 32	247	13 0.5	165	15.1	55.4
10	13 56 39	246	13 17.0	163	15.1	55.4
12	14 0 45	248	13 33.3	159	15.1	55.3
14	14 4 53	247	13 49.2	157	15.1	55.3
16	14 9 0	247	14 4.9	155	15.1	55.2
18	14 13 7	248	14 20.4	151	15.1	55.2
20	14 17 15	248	14 35.5	148	15.1	55.2
22	14 21 23	248	14 50.3	145	15.0	55.1
	April 5.					
0	14 25 31	248	−15 4.8	143	15.0	55.1
2	14 29 39	248	15 19.1	139	15.0	55.0
4	14 33 47	249	15 33.0	136	15.0	55.0
6	14 37 56	249	15 46.6	133	15.0	55.0
8	14 42 5	249	15 59.9	130	15.0	54.9
10	14 46 14	249	16 12.9	126	15.0	54.9
12	14 50 23	250	16 25.5	124	15.0	54.9
14	14 54 33	249	16 37.9	120	15.0	54.8
16	14 58 42	250	16 49.9	117	15.0	54.8
18	15 2 52	250	17 1.6	113	15.0	54.8
20	15 7 2	250	17 12.9	110	14.9	54.8
22	15 11 12	251	17 23.9	107	14.9	54.7
24	15 15 23		−17 34.6		14.9	54.7

Full Moon, Apr. 2d 22h 55m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	April 6.					
h	h m s		° ′		′	″
0	15 15 23	250	−17 34.6	103	14.9	54.7
2	15 19 33	251	17 44.9	100	14.9	54.7
4	15 23 44	251	17 54.9	96	14.9	54.6
6	15 27 55	251	18 4.5	93	14.9	54.6
8	15 32 6	251	18 13.8	89	14.9	54.6
10	15 36 17	252	18 22.7	86	14.9	54.6
12	15 40 29	251	18 31.3	82	14.9	54.5
14	15 44 40	252	18 39.5	79	14.9	54.5
16	15 48 52	251	18 47.4	75	14.9	54.5
18	15 53 3	252	18 54.9	72	14.9	54.5
20	15 57 15	252	19 2.1	67	14.9	54.4
22	16 1 27	252	19 8.8	65	14.9	54.4
	April 7.					
0	16 5 39	253	−19 15.3	60	14.8	54.4
2	16 9 52	252	19 21.3	57	14.8	54.4
4	16 14 4	252	19 27.0	53	14.8	54.4
6	16 18 16	253	19 32.3	49	14.8	54.3
8	16 22 29	252	19 37.2	46	14.8	54.3
10	16 26 41	252	19 41.8	42	14.8	54.3
12	16 30 53	253	19 46.0	38	14.8	54.3
14	16 35 6	252	19 49.8	35	14.8	54.3
16	16 39 18	253	19 53.3	31	14.8	54.3
18	16 43 31	253	19 56.4	27	14.8	54.2
20	16 47 44	252	19 59.1	23	14.8	54.2
22	16 51 56	253	20 1.4	20	14.8	54.2
	April 8.					
0	16 56 9	252	−20 3.4	16	14.8	54.2
2	17 0 21	253	20 5.0	12	14.8	54.2
4	17 4 34	252	20 6.2	8	14.8	54.2
6	17 8 46	252	20 7.0	5	14.8	54.2
8	17 12 58	253	20 7.5	1	14.8	54.2
10	17 17 11	252	20 7.6	—	14.8	54.2
12	17 21 23	252	20 7.3	3	14.8	54.2
14	17 25 35	252	20 6.6	7	14.8	54.2
16	17 29 47	252	20 5.6	10	14.8	54.2
18	17 33 59	252	20 4.2	14	14.8	54.2
20	17 38 11	252	20 2.4	18	14.8	54.2
22	17 42 23	251	20 0.2	22	14.8	54.2
	April 9.			25		
0	17 46 34	252	−19 57.7	29	14.8	54.2
2	17 50 46	251	19 54.8	32	14.8	54.2
4	17 54 57	251	19 51.6	37	14.8	54.2
6	17 59 8	251	19 47.9	39	14.8	54.2
8	18 3 19	251	19 44.0	44	14.8	54.2
10	18 7 30	250	19 39.6	47	14.8	54.2
12	18 11 40	251	19 34.9	51	14.8	54.2
14	18 15 51	250	19 29.8	55	14.8	54.2
16	18 20 1	250	19 24.3	58	14.8	54.3
18	18 24 11	250	19 18.5	61	14.8	54.3
20	18 28 21	250	19 12.4	65	14.8	54.3
22	18 32 31	249	19 5.9	69	14.8	54.3
24	18 36 40		−18 59.0		14.8	54.3

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	April 10.					
h	h m s		° ′		′	″
0	18 36 40	250	−18 59.0	72	14.8	54.3
2	18 40 50	249	18 51.8	76	14.8	54.3
4	18 44 59	249	18 44.2	79	14.8	54.4
6	18 49 8	248	18 36.3	83	14.8	54.4
8	18 53 16	249	18 28.0	86	14.9	54.4
10	18 57 25	248	18 19.4	89	14.9	54.4
12	19 1 33	248	18 10.5	93	14.9	54.5
14	19 5 41	248	18 1.2	97	14.9	54.5
16	19 9 49	248	17 51.5	99	14.9	54.5
18	19 13 57	247	17 41.6	103	14.9	54.5
20	19 18 4	247	17 31.3	107	14.9	54.6
22	19 22 11	247	17 20.6	109	14.9	54.6
	April 11.					
0	19 26 18	247	−17 9.7	113	14.9	54.6
2	19 30 25	247	16 58.4	116	14.9	54.7
4	19 34 32	246	16 46.8	119	14.9	54.7
6	19 38 38	246	16 34.9	123	14.9	54.7
8	19 42 44	246	16 22.6	126	15.0	54.8
10	19 46 50	246	16 10.0	128	15.0	54.8
12	19 50 56	246	15 57.2	132	15.0	54.8
14	19 55 2	245	15 44.0	135	15.0	54.9
16	19 59 7	246	15 30.5	138	15.0	54.9
18	20 3 13	245	15 16.7	141	15.0	55.0
20	20 7 18	245	15 2.6	144	15.0	55.0
22	20 11 23	245	14 48.2	146	15.0	55.1
	April 12.					
0	20 15 28	245	−14 33.6	150	15.0	55.1
2	20 19 33	244	14 18.6	153	15.1	55.1
4	20 23 37	245	14 3.3	155	15.1	55.2
6	20 27 42	245	13 47.8	158	15.1	55.2
8	20 31 47	244	13 32.0	162	15.1	55.3
10	20 35 51	244	13 15.8	163	15.1	55.3
12	20 39 55	245	12 59.5	167	15.1	55.4
14	20 44 0	244	12 42.8	169	15.1	55.4
16	20 48 4	244	12 25.9	172	15.2	55.5
18	20 52 8	244	12 8.7	174	15.2	55.6
20	20 56 12	244	11 51.3	177	15.2	55.6
22	21 0 16	244	11 33.6	179	15.2	55.7
	April 13.					
0	21 4 20	245	−11 15.7	182	15.2	55.7
2	21 8 25	244	10 57.5	184	15.2	55.8
4	21 12 29	244	10 39.1	187	15.2	55.8
6	21 16 33	245	10 20.4	189	15.3	55.9
8	21 20 38	244	10 1.5	191	15.3	56.0
10	21 24 42	245	9 42.4	194	15.3	56.0
12	21 28 47	244	9 23.0	196	15.3	56.1
14	21 32 51	245	9 3.4	198	15.3	56.1
16	21 36 56	245	8 43.6	200	15.3	56.2
18	21 41 1	245	8 23.6	202	15.4	56.3
20	21 45 6	246	8 3.4	204	15.4	56.3
22	21 49 12	245	7 43.0	206	15.4	56.4
24	21 53 17		− 7 22.4		15.4	56.5

Last Quarter, Apr. 11d 1h 24m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.	G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	April 14.							April 18.					
h	h m s		° ′		′	′	h	h m s		° ′		′	′
0	21 53 17	246	− 7 22.4	208	15.4	56.5	0	1 20 50	281	+10 44.3	211	16.3	59.6
2	21 57 23	246	7 1.6	210	15.4	56.5	2	1 25 31	282	11 5.4	208	16.3	59.7
4	22 1 29	246	6 40.6	212	15.5	56.6	4	1 30 14	283	11 26.2	206	16.3	59.7
6	22 5 35	247	6 19.4	213	15.5	56.7	6	1 34 57	285	11 46.8	204	16.3	59.8
8	22 9 42	247	5 58.1	215	15.5	56.7	8	1 39 42	286	12 7.2	200	16.3	59.8
10	22 13 49	247	5 36.6	217	15.5	56.8	10	1 44 28	287	12 27.2	198	16.3	59.9
12	22 17 56	248	5 14.9	218	15.5	56.9	12	1 49 15	289	12 47.0	195	16.3	59.9
14	22 22 4	248	4 53.1	220	15.5	56.9	14	1 54 4	289	13 6.5	192	16.4	59.9
16	22 26 12	248	4 31.1	221	15.6	57.0	16	1 58 53	290	13 25.7	188	16.4	60.0
18	22 30 20	249	4 9.0	223	15.6	57.1	18	2 3 43	292	13 44.5	186	16.4	60.0
20	22 34 29	249	3 46.7	224	15.6	57.2	20	2 8 35	293	14 3.1	181	16.4	60.1
22	22 38 38	250	3 24.3	225	15.6	57.2	22	2 13 28	293	14 21.2	178	16.4	60.1
	April 15.							April 19.					
0	22 42 48	250	− 3 1.8	227	15.6	57.3	0	2 18 21	295	+14 39.0	175	16.4	60.1
2	22 46 58	251	2 39.1	227	15.7	57.4	2	2 23 16	296	14 56.5	171	16.4	60.2
4	22 51 9	251	2 16.4	229	15.7	57.4	4	2 28 12	297	15 13.6	166	16.4	60.2
6	22 55 20	252	1 53.5	230	15.7	57.5	6	2 33 9	298	15 30.2	163	16.4	60.2
8	22 59 32	253	1 30.5	230	15.7	57.6	8	2 38 7	299	15 46.5	159	16.4	60.2
10	23 3 45	253	1 7.5	232	15.7	57.7	10	2 43 6	300	16 2.4	154	16.4	60.3
12	23 7 58	253	0 44.3	232	15.8	57.7	12	2 48 6	301	16 17.8	150	16.5	60.3
14	23 12 11	255	− 0 21.1	232	15.8	57.8	14	2 53 7	302	16 32.8	146	16.5	60.3
16	23 16 26	254	+ 0 2.1	234	15.8	57.9	16	2 58 9	303	16 47.4	141	16.5	60.3
18	23 20 40	256	0 25.5	234	15.8	57.9	18	3 3 12	304	17 1.5	136	16.5	60.3
20	23 24 56	256	0 48.9	234	15.8	58.0	20	3 8 16	305	17 15.1	132	16.5	60.3
22	23 29 12	257	1 12.3	235	15.9	58.1	22	3 13 21	305	17 28.3	127	16.5	60.4
	April 16.							April 20.					
0	23 33 29	258	+ 1 35.8	235	15.9	58.2	0	3 18 26	306	+17 41.0	122	16.5	60.4
2	23 37 47	259	1 59.3	235	15.9	58.2	2	3 23 32	307	17 53.2	117	16.5	60.4
4	23 42 6	259	2 22.8	235	15.9	58.3	4	3 28 39	308	18 4.9	112	16.5	60.4
6	23 46 25	260	2 46.3	235	15.9	58.4	6	3 33 47	308	18 16.1	107	16.5	60.4
8	23 50 45	261	3 9.8	235	15.9	58.4	8	3 38 55	309	18 26.8	102	16.5	60.4
10	23 55 6	262	3 33.3	235	16.0	58.5	10	3 44 4	310	18 37.0	96	16.5	60.4
12	23 59 28	263	3 56.8	234	16.0	58.6	12	3 49 14	310	18 46.6	91	16.5	60.4
14	0 3 51	264	4 20.2	234	16.0	58.6	14	3 54 24	311	18 55.7	86	16.5	60.4
16	0 8 15	264	4 43.6	234	16.0	58.7	16	3 59 35	311	19 4.3	80	16.5	60.4
18	0 12 39	266	5 7.0	233	16.0	58.8	18	4 4 46	311	19 12.3	75	16.5	60.4
20	0 17 5	266	5 30.3	232	16.1	58.8	20	4 9 57	312	19 19.8	69	16.5	60.4
22	0 21 31	268	5 53.5	232	16.1	58.9	22	4 15 9	312	19 26.7	64	16.5	60.4
	April 17.							April 21.					
0	0 25 59	268	+ 6 16.7	231	16.1	59.0	0	4 20 21	313	+19 33.1	58	16.5	60.4
2	0 30 27	270	6 39.8	229	16.1	59.0	2	4 25 34	313	19 38.9	52	16.5	60.4
4	0 34 57	270	7 2.7	229	16.1	59.1	4	4 30 47	312	19 44.1	47	16.5	60.4
6	0 39 27	272	7 25.6	227	16.1	59.1	6	4 35 59	313	19 48.8	41	16.5	60.3
8	0 43 59	272	7 48.3	226	16.2	59.2	8	4 41 12	313	19 52.9	35	16.5	60.3
10	0 48 31	274	8 10.9	224	16.2	59.3	10	4 46 25	313	19 56.4	30	16.5	60.3
12	0 53 5	275	8 33.3	223	16.2	59.3	12	4 51 38	313	19 59.4	24	16.5	60.3
14	0 57 40	276	8 55.6	221	16.2	59.4	14	4 56 51	313	20 1.8	18	16.5	60.3
16	1 2 16	276	9 17.7	220	16.2	59.4	16	5 2 4	312	20 3.6	12	16.4	60.3
18	1 6 52	278	9 39.7	217	16.2	59.5	18	5 7 16	313	20 4.8	6	16.4	60.2
20	1 11 30	280	10 1.4	215	16.2	59.5	20	5 12 29	312	20 5.4	1	16.4	60.2
22	1 16 10	280	10 22.9	214	16.3	59.6	22	5 17 41	312	20 5.5	— 5	16.4	60.2
24	1 20 50		+10 44.3		16.3	59.6	24	5 22 53		+20 5.0		16.4	60.2

New Moon, Apr. 18d 9h 43m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	April 22.					
h	h m s		° ′		′	′
0	5 22 53	311	+20 5.0	10	16.4	60.2
2	5 28 4	311	20 4.0	16	16.4	60.1
4	5 33 15	311	20 2.4	22	16.4	60.1
6	5 38 26	310	20 0.2	28	16.4	60.1
8	5 43 36	309	19 57.4	33	16.4	60.1
10	5 48 45	309	19 54.1	38	16.4	60.0
12	5 53 54	308	19 50.3	44	16.4	60.0
14	5 59 2	308	19 45.9	50	16.4	60.0
16	6 4 10	307	19 40.9	55	16.4	59.9
18	6 9 17	306	19 35.4	60	16.3	59.9
20	6 14 23	305	19 29.4	65	16.3	59.8
22	6 19 28	304	19 22.9	71	16.3	59.8
	April 23.					
0	6 24 32	304	+19 15.8	76	16.3	59.8
2	6 29 36	302	19 8.2	81	16.3	59.7
4	6 34 38	302	19 0.1	85	16.3	59.7
6	6 39 40	301	18 51.6	91	16.3	59.7
8	6 44 41	299	18 42.5	96	16.3	59.6
10	6 49 40	299	18 32.9	100	16.3	59.6
12	6 54 39	297	18 22.9	105	16.2	59.5
14	6 59 36	297	18 12.4	109	16.2	59.5
16	7 4 33	295	18 1.5	114	16.2	59.4
18	7 9 28	295	17 50.1	119	16.2	59.4
20	7 14 23	293	17 38.2	123	16.2	59.3
22	7 19 16	293	17 25.9	127	16.2	59.3
	April 24.					
0	7 24 8	291	+17 13.2	131	16.2	59.3
2	7 28 59	289	17 0.1	135	16.2	59.2
4	7 33 48	289	16 46.6	140	16.1	59.2
6	7 38 37	287	16 32.6	143	16.1	59.1
8	7 43 24	286	16 18.3	147	16.1	59.1
10	7 48 10	285	16 3.6	150	16.1	59.0
12	7 52 55	284	15 48.6	154	16.1	59.0
14	7 57 39	282	15 33.2	158	16.1	58.9
16	8 2 21	282	15 17.4	161	16.1	58.9
18	8 7 3	280	15 1.3	165	16.1	58.8
20	8 11 43	279	14 44.8	167	16.0	58.8
22	8 16 22	277	14 28.1	171	16.0	58.7
	April 25.					
0	8 20 59	277	+14 11.0	174	16.0	58.7
2	8 25 36	275	13 53.6	176	16.0	58.6
4	8 30 11	275	13 36.0	180	16.0	58.6
6	8 34 46	275	13 18.0	182	16.0	58.5
8	8 39 19	272	12 59.8	185	16.0	58.5
10	8 43 51	270	12 41.3	188	15.9	58.4
12	8 48 21	270	12 22.5	189	15.9	58.4
14	8 52 51	269	12 3.6	193	15.9	58.3
16	8 57 20	267	11 44.3	194	15.9	58.3
18	9 1 47	267	11 24.9	197	15.9	58.2
20	9 6 14	265	11 5.2	199	15.9	58.2
22	9 10 39	264	10 45.3	201	15.9	58.1
24	9 15 3		+10 25.2		15.8	58.1
	April 26.					
0	9 15 3	264	+10 25.2	202	15.8	58.1
2	9 19 27	262	10 5.0	205	15.8	58.0
4	9 23 49	261	9 44.5	206	15.8	58.0
6	9 28 10	261	9 23.9	208	15.8	57.9
8	9 32 31	259	9 3.1	209	15.8	57.9
10	9 36 50	259	8 42.2	211	15.8	57.8
12	9 41 9	257	8 21.1	213	15.8	57.8
14	9 45 26	257	7 59.8	213	15.8	57.7
16	9 49 43	256	7 38.5	215	15.7	57.7
18	9 53 59	255	7 17.0	216	15.7	57.6
20	9 58 14	255	6 55.4	217	15.7	57.6
22	10 2 29	253	6 33.7	218	15.7	57.5
	April 27.					
0	10 6 42	253	+ 6 11.9	219	15.7	57.5
2	10 10 55	252	5 50.0	220	15.7	57.4
4	10 15 7	251	5 28.0	220	15.7	57.4
6	10 19 18	251	5 6.0	222	15.6	57.3
8	10 23 29	250	4 43.8	221	15.6	57.3
10	10 27 39	249	4 21.7	223	15.6	57.2
12	10 31 48	249	3 59.4	222	15.6	57.2
14	10 35 57	248	3 37.2	224	15.6	57.1
16	10 40 5	248	3 14.8	223	15.6	57.1
18	10 44 13	247	2 52.5	223	15.6	57.0
20	10 48 20	247	2 30.2	224	15.6	57.0
22	10 52 27	246	2 7.8	224	15.5	56.9
	April 28.					
0	10 56 33	245	+ 1 45.4	224	15.5	56.9
2	11 0 38	246	1 23.0	224	15.5	56.8
4	11 4 44	244	1 0.6	223	15.5	56.8
6	11 8 48	245	0 38.3	224	15.5	56.7
8	11 12 53	244	+ 0 15.9	223	15.5	56.7
10	11 16 57	244	− 0 6.4	223	15.5	56.7
12	11 21 1	243	0 28.7	222	15.5	56.6
14	11 25 4	243	0 50.9	222	15.4	56.6
16	11 29 7	243	1 13.1	221	15.4	56.5
18	11 33 10	242	1 35.2	221	15.4	56.5
20	11 37 12	243	1 57.3	220	15.4	56.4
22	11 41 15	242	2 19.3	220	15.4	56.4
	April 29.					
0	11 45 17	242	− 2 41.3	218	15.4	56.3
2	11 49 19	241	3 3.1	218	15.4	56.3
4	11 53 20	242	3 24.9	217	15.4	56.3
6	11 57 22	242	3 46.6	215	15.3	56.2
8	12 1 24	241	4 8.1	215	15.3	56.2
10	12 5 25	241	4 29.6	214	15.3	56.1
12	12 9 26	241	4 51.0	212	15.3	56.1
14	12 13 27	242	5 12.2	211	15.3	56.1
16	12 17 29	241	5 33.3	210	15.3	56.0
18	12 21 30	241	5 54.3	209	15.3	56.0
20	12 25 31	241	6 15.2	207	15.3	55.9
22	12 29 32	241	6 35.9	206	15.3	55.9
24	12 33 33		− 6 56.5		15.2	55.9

First Quarter, Apr. 25d 1h 28m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	April 30.					
h	h m s		° ′		′	′
0	12 33 33	242	− 6 56.5	204	15.2	55.9
2	12 37 35	241	7 16.9	202	15.2	55.8
4	12 41 36	241	7 37.1	201	15.2	55.8
6	12 45 37	242	7 57.2	200	15.2	55.7
8	12 49 39	241	8 17.2	197	15.2	55.7
10	12 53 40	242	8 36.9	196	15.2	55.7
12	12 57 42	242	8 56.5	193	15.2	55.6
14	13 1 44	242	9 15.8	192	15.2	55.6
16	13 5 46	242	9 35.0	190	15.2	55.5
18	13 9 48	242	9 54.0	188	15.2	55.5
20	13 13 50	243	10 12.8	186	15.1	55.5
22	13 17 53	242	10 31.4	183	15.1	55.4
	May 1.					
0	13 21 55	243	−10 49.7	182	15.1	55.4
2	13 25 58	243	11 7.9	179	15.1	55.4
4	13 30 1	244	11 25.8	177	15.1	55.3
6	13 34 5	243	11 43.5	174	15.1	55.3
8	13 38 8	244	12 0.9	172	15.1	55.3
10	13 42 12	244	12 18.1	170	15.1	55.2
12	13 46 16	244	12 35.1	167	15.1	55.2
14	13 50 20	245	12 51.8	164	15.1	55.2
16	13 54 25	245	13 8.2	162	15.0	55.1
18	13 58 30	245	13 24.4	160	15.0	55.1
20	14 2 35	245	13 40.4	156	15.0	55.1
22	14 6 40	246	13 56.0	154	15.0	55.0
	May 2.					
0	14 10 46	246	−14 11.4	152	15.0	55.0
2	14 14 52	246	14 26.6	148	15.0	55.0
4	14 18 58	246	14 41.4	145	15.0	54.9
6	14 23 4	247	14 55.9	143	15.0	54.9
8	14 27 11	247	15 10.2	139	15.0	54.9
10	14 31 18	248	15 24.1	137	15.0	54.8
12	14 35 26	247	15 37.8	134	15.0	54.8
14	14 39 33	248	15 51.2	130	15.0	54.8
16	14 43 41	248	16 4.2	127	14.9	54.8
18	14 47 49	249	16 16.9	125	14.9	54.7
20	14 51 58	249	16 29.4	121	14.9	54.7
22	14 56 7	249	16 41.5	118	14.9	54.7
	May 3.					
0	15 0 16	249	−16 53.3	114	14.9	54.6
2	15 4 25	249	17 4.7	111	14.9	54.6
4	15 8 34	250	17 15.8	108	14.9	54.6
6	15 12 44	250	17 26.6	105	14.9	54.6
8	15 16 54	250	17 37.1	101	14.9	54.5
10	15 21 4	251	17 47.2	98	14.9	54.5
12	15 25 15	251	17 57.0	95	14.9	54.5
14	15 29 26	250	18 6.5	91	14.9	54.5
16	15 33 36	252	18 15.6	87	14.9	54.5
18	15 37 48	251	18 24.3	84	14.9	54.4
20	15 41 59	251	18 32.7	80	14.9	54.4
22	15 46 10	252	18 40.7	77	14.8	54.4
24	15 50 22		−18 48.4		14.8	54.4

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	May 4.					
h	h m s		° ′		′	′
0	15 50 22	252	−18 48.4	73	14.8	54.4
2	15 54 34	252	18 55.7	70	14.8	54.3
4	15 58 46	252	19 2.7	66	14.8	54.3
6	16 2 58	252	19 9.3	63	14.8	54.3
8	16 7 10	253	19 15.6	58	14.8	54.3
10	16 11 23	252	19 21.4	55	14.8	54.3
12	16 15 35	253	19 26.9	52	14.8	54.3
14	16 19 48	253	19 32.1	47	14.8	54.2
16	16 24 1	252	19 36.8	44	14.8	54.2
18	16 28 13	253	19 41.2	41	14.8	54.2
20	16 32 26	253	19 45.3	36	14.8	54.2
22	16 36 39	253	19 48.9	33	14.8	54.2
	May 5.					
0	16 40 52	253	−19 52.2	29	14.8	54.2
2	16 45 5	253	19 55.1	26	14.8	54.2
4	16 49 18	252	19 57.7	21	14.8	54.1
6	16 53 30	253	19 59.8	18	14.8	54.1
8	16 57 43	253	20 1.6	14	14.8	54.1
10	17 1 56	253	20 3.0	11	14.8	54.1
12	17 6 9	252	20 4.1	6	14.8	54.1
14	17 10 21	253	20 4.7	3	14.8	54.1
16	17 14 34	252	20 5.0	0	14.8	54.1
18	17 18 46	253	20 5.0	5	14.8	54.1
20	17 22 59	252	20 4.5	8	14.8	54.1
22	17 27 11	252	20 3.7	12	14.8	54.1
	May 6.					
0	17 31 23	252	−20 2.5	16	14.8	54.1
2	17 35 35	252	20 0.9	20	14.8	54.1
4	17 39 47	251	19 58.9	23	14.8	54.1
6	17 43 58	252	19 56.6	26	14.8	54.1
8	17 48 10	251	19 54.0	31	14.8	54.1
10	17 52 21	251	19 50.9	34	14.8	54.1
12	17 56 32	251	19 47.5	38	14.8	54.1
14	18 0 43	251	19 43.7	41	14.8	54.1
16	18 4 54	250	19 39.6	45	14.8	54.1
18	18 9 4	250	19 35.1	49	14.8	54.1
20	18 13 14	250	19 30.2	52	14.8	54.1
22	18 17 24	249	19 25.0	56	14.8	54.1
	May 7.					
0	18 21 33	250	−19 19.4	59	14.8	54.1
2	18 25 43	249	19 13.5	63	14.8	54.1
4	18 29 52	249	19 7.2	66	14.8	54.1
6	18 34 1	248	19 0.6	70	14.8	54.1
8	18 38 9	248	18 53.6	73	14.8	54.1
10	18 42 17	248	18 46.3	77	14.8	54.1
12	18 46 25	248	18 38.6	80	14.8	54.2
14	18 50 33	247	18 30.6	83	14.8	54.2
16	18 54 40	247	18 22.3	87	14.8	54.2
18	18 58 47	247	18 13.6	90	14.8	54.2
20	19 2 54	246	18 4.6	94	14.8	54.2
22	19 7 0	246	17 55.2	96	14.8	54.2
24	19 11 6		−17 45.6		14.8	54.3

Full Moon, May 2d 13h 47m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	May 8.					
h	h m s		° ′		′	″
0	19 11 6	246	−17 45.6	100	14.8	54.3
2	19 15 12	245	17 35.6	104	14.8	54.3
4	19 19 17	245	17 25.2	106	14.8	54.3
6	19 23 22	245	17 14.6	109	14.8	54.3
8	19 27 27	245	17 3.7	113	14.8	54.3
10	19 31 32	244	16 52.4	116	14.8	54.4
12	19 35 36	244	16 40.8	119	14.8	54.4
14	19 39 40	243	16 28.9	122	14.9	54.4
16	19 43 43	244	16 16.7	125	14.9	54.4
18	19 47 47	243	16 4.2	127	14.9	54.5
20	19 51 50	242	15 51.5	131	14.9	54.5
22	19 55 52	243	15 38.4	134	14.9	54.5
	May 9.					
0	19 59 55	242	−15 25.0	137	14.9	54.6
2	20 3 57	242	15 11.3	139	14.9	54.6
4	20 7 59	242	14 57.4	142	14.9	54.6
6	20 12 1	241	14 43.2	145	14.9	54.7
8	20 16 2	242	14 28.7	148	14.9	54.7
10	20 20 4	241	14 13.9	151	14.9	54.7
12	20 24 5	240	13 58.8	153	15.0	54.8
14	20 28 5	241	13 43.5	156	15.0	54.8
16	20 32 6	240	13 27.9	158	15.0	54.9
18	20 36 6	241	13 12.1	161	15.0	54.9
20	20 40 7	240	12 56.0	164	15.0	54.9
22	20 44 7	240	12 39.6	166	15.0	55.0
	May 10.					
0	20 48 7	240	−12 23.0	168	15.0	55.0
2	20 52 7	240	12 6.2	171	15.0	55.1
4	20 56 7	239	11 49.1	174	15.0	55.1
6	21 0 6	240	11 31.7	175	15.1	55.2
8	21 4 6	239	11 14.2	178	15.1	55.2
10	21 8 5	240	10 56.4	180	15.1	55.3
12	21 12 5	239	10 38.4	183	15.1	55.3
14	21 16 4	240	10 20.1	185	15.1	55.4
16	21 20 4	239	10 1.6	186	15.1	55.4
18	21 24 3	240	9 43.0	189	15.1	55.5
20	21 28 3	239	9 24.1	191	15.2	55.5
22	21 32 2	240	9 5.0	193	15.2	55.6
	May 11.					
0	21 36 2	239	− 8 45.7	195	15.2	55.7
2	21 40 1	240	8 26.2	197	15.2	55.7
4	21 44 1	240	8 6.5	199	15.2	55.8
6	21 48 1	240	7 46.6	201	15.2	55.8
8	21 52 1	240	7 26.5	202	15.3	55.9
10	21 56 1	241	7 6.3	205	15.3	56.0
12	22 0 2	241	6 45.8	205	15.3	56.0
14	22 4 3	240	6 25.3	208	15.3	56.1
16	22 8 3	242	6 4.5	209	15.3	56.2
18	22 12 5	241	5 43.6	211	15.3	56.2
20	22 16 6	242	5 22.5	212	15.4	56.3
22	22 20 8	242	5 1.3	214	15.4	56.4
24	22 24 10		− 4 39.9		15.4	56.4

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	May 12.					
h	h m s		° ′		′	″
0	22 24 10	243	− 4 39.9	215	15.4	56.4
2	22 28 13	242	4 18.4	217	15.4	56.5
4	22 32 15	244	3 56.7	218	15.4	56.6
6	22 36 19	243	3 34.9	219	15.5	56.6
8	22 40 22	245	3 13.0	220	15.5	56.7
10	22 44 27	244	2 51.0	221	15.5	56.8
12	22 48 31	246	2 28.9	223	15.5	56.9
14	22 52 37	245	2 6.6	223	15.5	56.9
16	22 56 42	247	1 44.3	225	15.6	57.0
18	23 0 49	247	1 21.8	225	15.6	57.1
20	23 4 56	247	0 59.3	226	15.6	57.2
22	23 9 3	249	0 36.7	227	15.6	57.2
	May 13.					
0	23 13 12	248	− 0 14.0	227	15.6	57.3
2	23 17 20	250	+ 0 8.7	229	15.7	57.4
4	23 21 30	250	0 31.6	228	15.7	57.5
6	23 25 40	251	0 54.4	229	15.7	57.5
8	23 29 51	252	1 17.3	230	15.7	57.6
10	23 34 3	253	1 40.3	230	15.7	57.7
12	23 38 16	254	2 3.3	230	15.8	57.8
14	23 42 30	254	2 26.3	230	15.8	57.8
16	23 46 44	255	2 49.3	230	15.8	57.9
18	23 50 59	257	3 12.3	231	15.8	58.0
20	23 55 16	257	3 35.4	230	15.9	58.1
22	23 59 33	258	3 58.4	230	15.9	58.2
	May 14.					
0	0 3 51	259	+ 4 21.4	230	15.9	58.2
2	0 8 10	260	4 44.4	229	15.9	58.3
4	0 12 30	262	5 7.3	229	15.9	58.4
6	0 16 52	262	5 30.2	229	16.0	58.5
8	0 21 14	263	5 53.1	227	16.0	58.5
10	0 25 37	265	6 15.8	227	16.0	58.6
12	0 30 2	266	6 38.5	227	16.0	58.7
14	0 34 28	266	7 1.2	225	16.0	58.8
16	0 38 54	268	7 23.7	224	16.1	58.9
18	0 43 22	270	7 46.1	223	16.1	58.9
20	0 47 52	270	8 8.4	222	16.1	59.0
22	0 52 22	272	8 30.6	221	16.1	59.1
	May 15.					
0	0 56 54	273	+ 8 52.7	219	16.1	59.2
2	1 1 27	274	9 14.6	217	16.2	59.2
4	1 6 1	276	9 36.3	216	16.2	59.3
6	1 10 37	277	9 57.9	214	16.2	59.4
8	1 15 14	278	10 19.3	212	16.2	59.5
10	1 19 52	279	10 40.5	210	16.2	59.5
12	1 24 31	281	11 1.5	207	16.3	59.6
14	1 29 12	282	11 22.2	206	16.3	59.7
16	1 33 54	284	11 42.8	203	16.3	59.7
18	1 38 38	285	12 3.1	201	16.3	59.8
20	1 43 23	286	12 23.2	198	16.3	59.9
22	1 48 9	288	12 43.0	195	16.4	59.9
24	1 52 57		+13 2.5		16.4	60.0

Last Quarter, May 10d 17h 51m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	May 16.					
h	h m s		° ′		′	′
0	1 52 57	289	+13 2.5	192	16.4	60.0
2	1 57 46	291	13 21.7	189	16.4	60.0
4	2 2 37	292	13 40.6	186	16.4	60.1
6	2 7 29	293	13 59.2	183	16.4	60.2
8	2 12 22	295	14 17.5	179	16.4	60.2
10	2 17 17	296	14 35.4	176	16.5	60.3
12	2 22 13	297	14 53.0	172	16.5	60.3
14	2 27 10	299	15 10.2	169	16.5	60.4
16	2 32 9	300	15 27.1	164	16.5	60.4
18	2 37 9	301	15 43.5	161	16.5	60.5
20	2 42 10	303	15 59.6	156	16.5	60.5
22	2 47 13	303	16 15.2	153	16.5	60.6
	May 17.					
0	2 52 16	305	+16 30.5	147	16.5	60.6
2	2 57 21	307	16 45.2	144	16.6	60.7
4	3 2 28	307	16 59.6	138	16.6	60.7
6	3 7 35	309	17 13.4	135	16.6	60.7
8	3 12 44	310	17 26.9	129	16.6	60.8
10	3 17 54	310	17 39.8	124	16.6	60.8
12	3 23 4	312	17 52.2	119	16.6	60.9
14	3 28 16	313	18 4.1	115	16.6	60.9
16	3 33 29	314	18 15.6	108	16.6	60.9
18	3 38 43	315	18 26.4	104	16.6	60.9
20	3 43 58	315	18 36.8	98	16.6	61.0
22	3 49 13	317	18 46.6	93	16.6	61.0
	May 18.					
0	3 54 30	317	+18 55.9	88	16.6	61.0
2	3 59 47	318	19 4.7	81	16.7	61.0
4	4 5 5	318	19 12.8	76	16.7	61.0
6	4 10 23	320	19 20.4	71	16.7	61.0
8	4 15 43	319	19 27.5	64	16.7	61.1
10	4 21 2	321	19 33.9	59	16.7	61.1
12	4 26 23	320	19 39.8	52	16.7	61.1
14	4 31 43	321	19 45.0	47	16.7	61.1
16	4 37 4	321	19 49.7	41	16.7	61.1
18	4 42 25	322	19 53.8	35	16.7	61.1
20	4 47 47	322	19 57.3	28	16.7	61.1
22	4 53 9	321	20 0.1	23	16.7	61.1
	May 19.					
0	4 58 30	322	+20 2.4	17	16.7	61.1
2	5 3 52	322	20 4.1	10	16.7	61.1
4	5 9 14	322	20 5.1	5	16.7	61.1
6	5 14 36	321	20 5.6	−2	16.7	61.0
8	5 19 57	321	20 5.4	7	16.7	61.0
10	5 25 18	322	20 4.7	14	16.7	61.0
12	5 30 40	320	20 3.3	20	16.6	61.0
14	5 36 0	321	20 1.3	25	16.6	61.0
16	5 41 21	319	19 58.8	32	16.6	61.0
18	5 46 40	320	19 55.6	38	16.6	60.9
20	5 52 0	318	19 51.8	43	16.6	60.9
22	5 57 18	318	19 47.5	49	16.6	60.9
24	6 2 36		+19 42.6		16.6	60.9

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	May 20.					
h	h m s		° ′		′	′
0	6 2 36	318	+19 42.6	55	16.6	60.9
2	6 7 54	316	19 37.1	61	16.6	60.8
4	6 13 10	316	19 31.0	66	16.6	60.8
6	6 18 26	315	19 24.4	72	16.6	60.8
8	6 23 41	314	19 17.2	78	16.6	60.7
10	6 28 55	313	19 9.4	82	16.6	60.7
12	6 34 8	312	19 1.2	89	16.6	60.6
14	6 39 20	311	18 52.3	93	16.5	60.6
16	6 44 31	310	18 43.0	99	16.5	60.6
18	6 49 41	309	18 33.1	103	16.5	60.5
20	6 54 50	308	18 22.8	109	16.5	60.5
22	6 59 58	306	18 11.9	113	16.5	60.4
	May 21.					
0	7 5 4	306	+18 0.6	119	16.5	60.4
2	7 10 10	304	17 48.7	123	16.5	60.3
4	7 15 14	303	17 36.4	128	16.4	60.3
6	7 20 17	301	17 23.6	132	16.4	60.2
8	7 25 18	300	17 10.4	136	16.4	60.2
10	7 30 18	299	16 56.8	141	16.4	60.1
12	7 35 17	298	16 42.7	145	16.4	60.1
14	7 40 15	296	16 28.2	149	16.4	60.0
16	7 45 11	295	16 13.3	153	16.4	59.9
18	7 50 6	293	15 58.0	157	16.3	59.9
20	7 54 59	292	15 42.3	160	16.3	59.8
22	7 59 51	291	15 26.3	164	16.3	59.8
	May 22.					
0	8 4 42	289	+15 9.9	168	16.3	59.7
2	8 9 31	288	14 53.1	171	16.3	59.6
4	8 14 19	286	14 36.0	174	16.3	59.6
6	8 19 5	286	14 18.6	177	16.2	59.5
8	8 23 51	283	14 0.9	181	16.2	59.5
10	8 28 34	283	13 42.8	183	16.2	59.4
12	8 33 17	280	13 24.5	186	16.2	59.3
14	8 37 57	280	13 5.9	189	16.2	59.3
16	8 42 37	278	12 47.0	192	16.2	59.2
18	8 47 15	277	12 27.8	194	16.1	59.1
20	8 51 52	276	12 8.4	196	16.1	59.1
22	8 56 28	274	11 48.8	199	16.1	59.0
	May 23.					
0	9 1 2	273	+11 28.9	201	16.1	58.9
2	9 5 35	272	11 8.8	202	16.1	58.9
4	9 10 7	270	10 48.6	205	16.0	58.8
6	9 14 37	269	10 28.1	207	16.0	58.7
8	9 19 6	268	10 7.4	209	16.0	58.7
10	9 23 34	267	9 46.5	210	16.0	58.6
12	9 28 1	265	9 25.5	212	16.0	58.5
14	9 32 26	265	9 4.3	213	16.0	58.4
16	9 36 51	263	8 43.0	215	15.9	58.4
18	9 41 14	262	8 21.5	216	15.9	58.3
20	9 45 36	261	7 59.9	217	15.9	58.2
22	9 49 57	260	7 38.2	218	15.9	58.2
24	9 54 17		+7 16.4		15.9	58.1

New Moon, May 17d 18h 25m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	h m s		° ′		′	′
May 24.						
h						
0	9 54 17	259	+7 16.4	219	15.9	58.1
2	9 58 36	258	6 54.5	221	15.8	58.0
4	10 2 54	257	6 32.4	221	15.8	58.0
6	10 7 11	256	6 10.3	221	15.8	57.9
8	10 11 27	256	5 48.2	223	15.8	57.8
10	10 15 43	254	5 25.9	223	15.8	57.8
12	10 19 57	253	5 3.6	224	15.8	57.7
14	10 24 10	253	4 41.2	224	15.7	57.6
16	10 28 23	251	4 18.8	224	15.7	57.6
18	10 32 34	251	3 56.4	225	15.7	57.5
20	10 36 45	250	3 33.9	225	15.7	57.4
22	10 40 55	250	3 11.4	225	15.7	57.4
May 25.						
0	10 45 5	249	+2 48.9	225	15.6	57.3
2	10 49 14	248	2 26.4	225	15.6	57.3
4	10 53 22	247	2 3.9	225	15.6	57.2
6	10 57 29	247	1 41.4	225	15.6	57.1
8	11 1 36	246	1 18.9	225	15.6	57.1
10	11 5 42	246	0 56.4	224	15.6	57.0
12	11 9 48	245	0 34.0	224	15.5	56.9
14	11 13 53	244	+0 11.6	224	15.5	56.9
16	11 17 57	244	−0 10.8	223	15.5	56.8
18	11 22 1	244	0 33.1	222	15.5	56.8
20	11 26 5	243	0 55.3	222	15.5	56.7
22	11 30 8	243	1 17.5	222	15.5	56.6
May 26.						
0	11 34 11	242	−1 39.7	220	15.4	56.6
2	11 38 13	242	2 1.7	220	15.4	56.5
4	11 42 15	242	2 23.7	219	15.4	56.5
6	11 46 17	241	2 45.6	218	15.4	56.4
8	11 50 18	242	3 7.4	217	15.4	56.4
10	11 54 20	241	3 29.1	216	15.4	56.3
12	11 58 21	240	3 50.7	215	15.4	56.3
14	12 2 21	241	4 12.2	214	15.3	56.2
16	12 6 22	240	4 33.6	212	15.3	56.1
18	12 10 22	240	4 54.8	211	15.3	56.1
20	12 14 22	240	5 15.9	210	15.3	56.0
22	12 18 22	240	5 36.9	209	15.3	56.0
May 27.						
0	12 22 22	240	−5 57.8	207	15.3	55.9
2	12 26 22	239	6 18.5	206	15.3	55.9
4	12 30 21	240	6 39.1	204	15.2	55.8
6	12 34 21	240	6 59.5	203	15.2	55.8
8	12 38 21	239	7 19.8	201	15.2	55.7
10	12 42 20	240	7 39.9	199	15.2	55.7
12	12 46 20	240	7 59.8	198	15.2	55.7
14	12 50 20	240	8 19.6	196	15.2	55.6
16	12 54 20	239	8 39.2	194	15.2	55.6
18	12 58 19	240	8 58.6	192	15.2	55.5
20	13 2 19	240	9 17.8	190	15.1	55.5
22	13 6 19	240	9 36.8	188	15.1	55.4
24	13 10 19		−9 55.6		15.1	55.4

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	h m s		° ′		′	′
May 28.						
h						
0	13 10 19	241	− 9 55.6	186	15.1	55.4
2	13 14 20	240	10 14.2	184	15.1	55.4
4	13 18 20	241	10 32.6	182	15.1	55.3
6	13 22 21	240	10 50.8	180	15.1	55.3
8	13 26 21	241	11 8.8	178	15.1	55.2
10	13 30 22	241	11 26.6	175	15.1	55.2
12	13 34 23	242	11 44.1	173	15.1	55.2
14	13 38 25	241	12 1.4	171	15.0	55.1
16	13 42 26	242	12 18.5	168	15.0	55.1
18	13 46 28	242	12 35.3	166	15.0	55.0
20	13 50 30	242	12 51.9	163	15.0	55.0
22	13 54 32	243	13 8.2	161	15.0	55.0
May 29.						
0	13 58 35	243	−13 24.3	158	15.0	54.9
2	14 2 38	243	13 40.1	156	15.0	54.9
4	14 6 41	243	13 55.7	153	15.0	54.9
6	14 10 44	244	14 11.0	150	15.0	54.8
8	14 14 48	244	14 26.0	147	15.0	54.8
10	14 18 52	245	14 40.7	145	15.0	54.8
12	14 22 57	244	14 55.2	142	14.9	54.7
14	14 27 1	245	15 9.4	139	14.9	54.7
16	14 31 6	245	15 23.3	136	14.9	54.7
18	14 35 11	246	15 36.9	133	14.9	54.7
20	14 39 17	246	15 50.2	130	14.9	54.6
22	14 43 23	246	16 3.2	127	14.9	54.6
May 30.						
0	14 47 29	247	−16 15.9	124	14.9	54.6
2	14 51 36	246	16 28.3	120	14.9	54.5
4	14 55 42	248	16 40.3	118	14.9	54.5
6	14 59 50	247	16 52.1	115	14.9	54.5
8	15 3 57	248	17 3.6	111	14.9	54.5
10	15 8 5	248	17 14.7	108	14.9	54.4
12	15 12 13	248	17 25.5	105	14.9	54.4
14	15 16 21	249	17 36.0	102	14.9	54.4
16	15 20 30	249	17 46.2	98	14.8	54.4
18	15 24 39	249	17 56.0	95	14.8	54.4
20	15 28 48	249	18 5.5	91	14.8	54.3
22	15 32 57	250	18 14.6	88	14.8	54.3
May 31.						
0	15 37 7	250	−18 23.4	85	14.8	54.3
2	15 41 17	250	18 31.9	81	14.8	54.3
4	15 45 27	251	18 40.0	77	14.8	54.3
6	15 49 38	251	18 47.7	74	14.8	54.2
8	15 53 49	251	18 55.1	71	14.8	54.2
10	15 58 0	251	19 2.2	67	14.8	54.2
12	16 2 11	251	19 8.9	63	14.8	54.2
14	16 6 22	252	19 15.2	60	14.8	54.2
16	16 10 34	251	19 21.2	56	14.8	54.2
18	16 14 45	252	19 26.8	53	14.8	54.1
20	16 18 57	252	19 32.1	49	14.8	54.1
22	16 23 9	252	19 37.0	45	14.8	54.1
24	16 27 21		−19 41.5		14.8	54.1

First Quarter, May 24d 9h 7m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	June 1.					
h	h m s		° ′	′	″	″
0	16 27 21	252	−19 41.5	41	14.8	54.1
2	16 31 33	253	19 45.6	38	14.8	54.1
4	16 35 46	252	19 49.4	34	14.8	54.1
6	16 39 58	253	19 52.8	31	14.8	54.1
8	16 44 11	252	19 55.9	27	14.8	54.1
10	16 48 23	253	19 58.6	23	14.8	54.1
12	16 52 36	252	20 0.9	19	14.8	54.0
14	16 56 48	253	20 2.8	15	14.7	54.0
16	17 1 1	252	20 4.3	12	14.7	54.0
18	17 5 13	253	20 5.5	8	14.7	54.0
20	17 9 26	253	20 6.3	4	14.7	54.0
22	17 13 39	252	20 6.7	1	14.7	54.0
	June 2.					
0	17 17 51	252	−20 6.8	3	14.7	54.0
2	17 22 3	253	20 6.5	7	14.7	54.0
4	17 26 16	252	20 5.8	11	14.7	54.0
6	17 30 28	252	20 4.7	14	14.7	54.0
8	17 34 40	252	20 3.3	18	14.7	54.0
10	17 38 52	252	20 1.5	22	14.7	54.0
12	17 43 4	252	19 59.3	25	14.7	54.0
14	17 47 16	251	19 56.8	29	14.7	54.0
16	17 51 27	251	19 53.9	33	14.7	54.0
18	17 55 38	252	19 50.6	36	14.7	54.0
20	17 59 50	250	19 47.0	40	14.7	54.0
22	18 4 0	251	19 43.0	44	14.7	54.0
	June 3.					
0	18 8 11	251	−19 38.6	47	14.7	54.0
2	18 12 22	250	19 33.9	51	14.7	54.0
4	18 16 32	250	19 28.8	55	14.7	54.0
6	18 20 42	249	19 23.3	58	14.7	54.0
8	18 24 51	250	19 17.5	61	14.7	54.0
10	18 29 1	249	19 11.4	65	14.7	54.0
12	18 33 10	249	19 4.9	69	14.7	54.0
14	18 37 19	248	18 58.0	72	14.7	54.0
16	18 41 27	248	18 50.8	75	14.7	54.0
18	18 45 35	248	18 43.3	79	14.7	54.0
20	18 49 43	247	18 35.4	82	14.8	54.0
22	18 53 50	247	18 27.2	85	14.8	54.1
	June 4.					
0	18 57 57	247	−18 18.7	89	14.8	54.1
2	19 2 4	247	18 9.8	92	14.8	54.1
4	19 6 11	246	18 0.6	96	14.8	54.1
6	19 10 17	245	17 51.0	98	14.8	54.1
8	19 14 22	246	17 41.2	102	14.8	54.1
10	19 18 28	245	17 31.0	105	14.8	54.1
12	19 22 33	244	17 20.5	108	14.8	54.1
14	19 26 37	245	17 9.7	112	14.8	54.2
16	19 30 42	243	16 58.5	114	14.8	54.2
18	19 34 45	244	16 47.1	117	14.8	54.2
20	19 38 49	243	16 35.4	121	14.8	54.2
22	19 42 52	243	16 23.3	123	14.8	54.2
24	19 46 55		−16 11.0		14.8	54.3

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	June 5.					
h	h m s		° ′	′	″	″
0	19 46 55	242	−16 11.0	126	14.8	54.3
2	19 50 57	242	15 58.4	129	14.8	54.3
4	19 54 59	242	15 45.5	132	14.8	54.3
6	19 59 1	241	15 32.3	135	14.8	54.3
8	20 3 2	241	15 18.8	138	14.8	54.3
10	20 7 3	241	15 5.0	140	14.8	54.4
12	20 11 4	240	14 51.0	143	14.8	54.4
14	20 15 4	240	14 36.7	146	14.9	54.4
16	20 19 4	240	14 22.1	149	14.9	54.5
18	20 23 4	239	14 7.2	150	14.9	54.5
20	20 27 3	239	13 52.2	154	14.9	54.5
22	20 31 2	239	13 36.8	156	14.9	54.5
	June 6.					
0	20 35 1	238	−13 21.2	159	14.9	54.6
2	20 38 59	238	13 5.3	161	14.9	54.6
4	20 42 57	238	12 49.2	163	14.9	54.6
6	20 46 55	238	12 32.9	166	14.9	54.7
8	20 50 53	238	12 16.3	168	14.9	54.7
10	20 54 51	237	11 59.5	170	14.9	54.7
12	20 58 48	237	11 42.5	173	15.0	54.8
14	21 2 45	237	11 25.2	174	15.0	54.8
16	21 6 42	236	11 7.8	177	15.0	54.9
18	21 10 38	237	10 50.1	179	15.0	54.9
20	21 14 35	236	10 32.2	181	15.0	54.9
22	21 18 31	237	10 14.1	183	15.0	55.0
	June 7.					
0	21 22 28	236	− 9 55.8	185	15.0	55.0
2	21 26 24	236	9 37.3	187	15.0	55.1
4	21 30 20	236	9 18.6	189	15.0	55.1
6	21 34 16	236	8 59.7	191	15.1	55.1
8	21 38 12	236	8 40.6	193	15.1	55.2
10	21 42 8	236	8 21.3	194	15.1	55.2
12	21 46 4	236	8 1.9	196	15.1	55.3
14	21 50 0	236	7 42.3	198	15.1	55.3
16	21 53 56	236	7 22.5	199	15.1	55.4
18	21 57 52	236	7 2.6	201	15.1	55.4
20	22 1 48	236	6 42.5	203	15.1	55.5
22	22 5 44	236	6 22.2	203	15.2	55.5
	June 8.					
0	22 9 40	237	− 6 1.9	206	15.2	55.6
2	22 13 37	236	5 41.3	207	15.2	55.7
4	22 17 33	237	5 20.6	208	15.2	55.7
6	22 21 30	237	4 59.8	209	15.2	55.8
8	22 25 27	238	4 38.9	211	15.2	55.8
10	22 29 25	237	4 17.8	212	15.3	55.9
12	22 33 22	238	3 56.6	213	15.3	55.9
14	22 37 20	238	3 35.3	214	15.3	56.0
16	22 41 18	239	3 13.9	215	15.3	56.1
18	22 45 17	239	2 52.4	216	15.3	56.1
20	22 49 16	239	2 30.8	218	15.3	56.2
22	22 53 15	239	2 9.0	218	15.4	56.3
24	22 57 15	240	− 1 47.2	218	15.4	56.3

Full Moon, June 1d 5h 18m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
June 9.						
h	h m s		° ′		′	″
0	22 57 15	240	− 1 47.2	218	15.4	56.3
2	23 1 15	241	1 25.4	220	15.4	56.4
4	23 5 16	241	1 3.4	220	15.4	56.5
6	23 9 17	242	0 41.4	221	15.4	56.5
8	23 13 19	242	− 0 19.3	222	15.4	56.6
10	23 17 21	243	+ 0 2.9	222	15.5	56.7
12	23 21 24	243	0 25.1	222	15.5	56.7
14	23 25 27	244	0 47.3	223	15.5	56.8
16	23 29 31	245	1 9.6	224	15.5	56.9
18	23 33 36	246	1 32.0	223	15.5	56.9
20	23 37 42	246	1 54.3	224	15.6	57.0
22	23 41 48	247	2 16.7	224	15.6	57.1
June 10.						
0	23 45 55	248	+ 2 39.1	224	15.6	57.2
2	23 50 3	249	3 1.5	224	15.6	57.2
4	23 54 12	249	3 23.9	224	15.6	57.3
6	23 58 21	251	3 46.3	224	15.7	57.4
8	0 2 32	251	4 8.7	223	15.7	57.5
10	0 6 43	252	4 31.0	224	15.7	57.5
12	0 10 55	254	4 53.4	223	15.7	57.6
14	0 15 9	254	5 15.7	222	15.7	57.7
16	0 19 23	255	5 37.9	222	15.8	57.8
18	0 23 38	256	6 0.1	221	15.8	57.8
20	0 27 54	258	6 22.2	221	15.8	57.9
22	0 32 12	258	6 44.3	220	15.8	58.0
June 11.						
0	0 36 30	260	+ 7 6.3	219	15.8	58.1
2	0 40 50	261	7 28.2	217	15.9	58.1
4	0 45 11	262	7 49.9	217	15.9	58.2
6	0 49 33	263	8 11.6	216	15.9	58.3
8	0 53 56	265	8 33.2	215	15.9	58.4
10	0 58 21	265	8 54.7	213	16.0	58.5
12	1 2 46	267	9 16.0	211	16.0	58.5
14	1 7 13	269	9 37.1	211	16.0	58.6
16	1 11 42	269	9 58.2	208	16.0	58.7
18	1 16 11	271	10 19.0	207	16.0	58.8
20	1 20 42	273	10 39.7	205	16.1	58.9
22	1 25 15	273	11 0.2	202	16.1	58.9
June 12.						
0	1 29 48	276	+11 20.4	201	16.1	59.0
2	1 34 24	276	11 40.5	199	16.1	59.1
4	1 39 0	278	12 0.4	196	16.1	59.2
6	1 43 38	280	12 20.0	194	16.2	59.2
8	1 48 18	280	12 39.4	191	16.2	59.3
10	1 52 58	283	12 58.5	189	16.2	59.4
12	1 57 41	284	13 17.4	186	16.2	59.5
14	2 2 25	285	13 36.0	183	16.2	59.5
16	2 7 10	287	13 54.3	180	16.3	59.6
18	2 11 57	288	14 12.3	177	16.3	59.7
20	2 16 45	290	14 30.0	174	16.3	59.8
22	2 21 35	291	14 47.4	171	16.3	59.8
24	2 26 26		+15 4.5		16.3	59.9

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
June 13.						
h	h m s		° ′		′	″
0	2 26 26	293	+15 4.5	167	16.3	59.9
2	2 31 19	294	15 21.2	163	16.4	60.0
4	2 36 13	296	15 37.5	160	16.4	60.0
6	2 41 9	297	15 53.5	155	16.4	60.1
8	2 46 6	299	16 9.0	152	16.4	60.2
10	2 51 5	300	16 24.2	148	16.4	60.2
12	2 56 5	301	16 39.0	144	16.5	60.3
14	3 1 6	303	16 53.4	139	16.5	60.4
16	3 6 9	305	17 7.3	135	16.5	60.4
18	3 11 14	305	17 20.8	130	16.5	60.5
20	3 16 19	307	17 33.8	126	16.5	60.5
22	3 21 26	309	17 46.4	121	16.5	60.6
June 14.						
0	3 26 35	309	+17 58.5	116	16.6	60.6
2	3 31 44	311	18 10.1	111	16.6	60.7
4	3 36 55	312	18 21.2	106	16.6	60.7
6	3 42 7	313	18 31.8	101	16.6	60.8
8	3 47 20	315	18 41.9	96	16.6	60.8
10	3 52 35	315	18 51.5	90	16.6	60.9
12	3 57 50	316	19 0.5	85	16.6	60.9
14	4 3 6	318	19 9.0	79	16.6	61.0
16	4 8 24	318	19 16.9	74	16.6	61.0
18	4 13 42	319	19 24.3	68	16.7	61.0
20	4 19 1	320	19 31.1	62	16.7	61.1
22	4 24 21	321	19 37.3	56	16.7	61.1
June 15.						
0	4 29 42	322	+19 42.9	51	16.7	61.2
2	4 35 4	322	19 48.0	45	16.7	61.2
4	4 40 26	322	19 52.5	38	16.7	61.2
6	4 45 48	324	19 56.3	33	16.7	61.2
8	4 51 12	323	19 59.6	26	16.7	61.3
10	4 56 35	324	20 2.2	21	16.7	61.3
12	5 1 59	325	20 4.3	14	16.7	61.3
14	5 7 24	324	20 5.7	8	16.7	61.3
16	5 12 48	325	20 6.5	2	16.7	61.3
18	5 18 13	325	20 6.7	4	16.7	61.3
20	5 23 38	325	20 6.3	11	16.7	61.3
22	5 29 8	325	20 5.2	17	16.7	61.4
June 16.						
0	5 34 28	325	+20 3.5	22	16.7	61.4
2	5 39 53	325	20 1.3	29	16.7	61.4
4	5 45 18	324	19 58.4	35	16.7	61.4
6	5 50 42	324	19 54.9	42	16.7	61.4
8	5 56 6	324	19 50.7	47	16.7	61.4
10	6 1 30	323	19 46.0	53	16.7	61.3
12	6 6 53	323	19 40.7	60	16.7	61.3
14	6 12 16	322	19 34.7	65	16.7	61.3
16	6 17 38	322	19 28.2	71	16.7	61.3
18	6 23 0	321	19 21.1	77	16.7	61.3
20	6 28 21	320	19 13.4	82	16.7	61.3
22	6 33 41	320	19 5.2	89	16.7	61.3
24	6 39 1		+18 56.3		16.7	61.2

Last Quarter, June 9d 6h 58m.
New Moon, June 16d 1h 41m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
June 17.						
h	h m s		° ′	′	′	′
0	6 39 1	318	+18 56.3	94	16.7	61.2
2	6 44 19	318	18 46.9	99	16.7	61.2
4	6 49 37	317	18 37.0	105	16.7	61.2
6	6 54 54	316	18 26.5	110	16.7	61.2
8	7 0 10	314	18 15.5	116	16.7	61.1
10	7 5 24	314	18 3.9	120	16.7	61.1
12	7 10 38	312	17 51.9	126	16.7	61.1
14	7 15 50	312	17 39.3	130	16.7	61.0
16	7 21 2	310	17 26.3	136	16.6	61.0
18	7 26 12	309	17 12.7	140	16.6	60.9
20	7 31 21	307	16 58.7	145	16.6	60.9
22	7 36 28	307	16 44.2	149	16.6	60.8
June 18.						
0	7 41 35	305	+16 29.3	153	16.6	60.8
2	7 46 40	304	16 14.0	158	16.6	60.8
4	7 51 44	302	15 58.2	162	16.6	60.7
6	7 56 46	301	15 42.0	166	16.6	60.7
8	8 1 47	300	15 25.4	169	16.5	60.6
10	8 6 47	298	15 8.5	174	16.5	60.5
12	8 11 45	297	14 51.1	177	16.5	60.5
14	8 16 42	295	14 33.4	180	16.5	60.4
16	8 21 37	294	14 15.4	184	16.5	60.4
18	8 26 31	293	13 57.0	187	16.5	60.3
20	8 31 24	291	13 38.3	191	16.4	60.2
22	8 36 15	289	13 19.2	193	16.4	60.2
June 19.						
0	8 41 4	289	+12 59.9	196	16.4	60.1
2	8 45 53	287	12 40.3	199	16.4	60.1
4	8 50 40	285	12 20.4	202	16.4	60.0
6	8 55 25	284	12 0.2	204	16.4	59.9
8	9 0 9	283	11 39.8	206	16.3	59.9
10	9 4 52	281	11 19.2	209	16.3	59.8
12	9 9 33	280	10 58.3	211	16.3	59.7
14	9 14 13	278	10 37.2	212	16.3	59.6
16	9 18 51	278	10 16.0	215	16.3	59.6
18	9 23 29	275	9 54.5	217	16.2	59.5
20	9 28 4	275	9 32.8	218	16.2	59.4
22	9 32 99	273	9 11.0	220	16.2	59.3
June 20.						
0	9 37 12	272	+8 49.0	221	16.2	59.3
2	9 41 44	271	8 26.9	222	16.2	59.2
4	9 46 15	270	8 4.7	224	16.1	59.1
6	9 50 45	268	7 42.3	225	16.1	59.0
8	9 55 13	267	7 19.8	226	16.1	59.0
10	9 59 40	266	6 57.2	227	16.1	58.9
12	10 4 6	265	6 34.5	227	16.1	58.8
14	10 8 31	263	6 11.8	229	16.0	58.7
16	10 12 54	263	5 48.9	229	16.0	58.7
18	10 17 17	262	5 26.0	229	16.0	58.6
20	10 21 39	260	5 3.1	230	16.0	58.5
22	10 25 59	260	4 40.1	231	15.9	58.4
24	10 30 19		+4 17.0		15.9	58.3

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
June 21.						
h	h m s		° ′	′	′	′
0	10 30 19	258	+ 4 17.0	230	15.9	58.3
2	10 34 37	258	3 54.0	231	15.9	58.3
4	10 38 55	257	3 30.9	231	15.9	58.2
6	10 43 12	255	3 7.8	231	15.9	58.1
8	10 47 27	255	2 44.7	231	15.8	58.0
10	10 51 42	254	2 21.6	230	15.8	58.0
12	10 55 56	254	1 58.6	231	15.8	57.9
14	11 0 10	252	1 35.5	230	15.8	57.8
16	11 4 22	252	1 12.5	230	15.8	57.7
18	11 8 34	251	0 49.5	229	15.7	57.6
20	11 12 45	250	0 26.6	229	15.7	57.6
22	11 16 55	250	+ 0 3.7	228	15.7	57.5
June 22.						
0	11 21 5	249	− 0 19.1	228	15.7	57.4
2	11 25 14	248	0 41.9	226	15.7	57.4
4	11 29 22	248	1 4.5	226	15.6	57.3
6	11 33 30	247	1 27.1	225	15.6	57.2
8	11 37 37	247	1 49.6	225	15.6	57.1
10	11 41 44	246	2 12.1	223	15.6	57.1
12	11 45 50	246	2 34.4	222	15.6	57.0
14	11 49 56	245	2 56.6	221	15.5	56.9
16	11 54 1	245	3 18.7	220	15.5	56.8
18	11 58 6	245	3 40.7	219	15.5	56.8
20	12 2 11	244	4 2.6	217	15.5	56.7
22	12 6 15	244	4 24.3	216	15.5	56.6
June 23.						
0	12 10 19	243	− 4 45.9	214	15.4	56.6
2	12 14 22	243	5 7.3	214	15.4	56.5
4	12 18 25	243	5 28.7	211	15.4	56.4
6	12 22 28	243	5 49.8	210	15.4	56.4
8	12 26 31	242	6 10.8	209	15.4	56.3
10	12 30 33	242	6 31.7	207	15.4	56.2
12	12 34 35	243	6 52.4	205	15.3	56.2
14	12 38 38	241	7 12.9	203	15.3	56.1
16	12 42 39	242	7 33.2	201	15.3	56.1
18	12 46 41	242	7 53.3	200	15.3	56.0
20	12 50 43	241	8 13.3	198	15.3	55.9
22	12 54 44	242	8 33.1	196	15.3	55.9
June 24.						
0	12 58 46	241	− 8 52.7	193	15.2	55.8
2	13 2 47	242	9 12.0	192	15.2	55.8
4	13 6 49	241	9 31.2	190	15.2	55.7
6	13 10 50	242	9 50.2	187	15.2	55.7
8	13 14 52	241	10 8.9	186	15.2	55.6
10	13 18 53	241	10 27.5	183	15.2	55.5
12	13 22 54	242	10 45.8	181	15.1	55.5
14	13 26 56	242	11 3.9	179	15.1	55.4
16	13 30 58	241	11 21.8	176	15.1	55.4
18	13 34 59	242	11 39.4	174	15.1	55.3
20	13 39 1	242	11 56.8	171	15.1	55.3
22	13 43 3	242	12 13.9	169	15.1	55.3
24	13 47 5		−12 30.8		15.1	55.2

First Quarter, June 22d 18h 50m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	June 25.					
h	h m s		° ′		′	″
0	13 47 5	242	−12 30.8	166	15.1	55.2
2	13 51 7	243	12 47.4	164	15.1	55.2
4	13 55 10	242	13 3.8	162	15.0	55.1
6	13 59 12	243	13 20.0	158	15.0	55.1
8	14 3 15	243	13 35.8	156	15.0	55.0
10	14 7 18	243	13 51.4	154	15.0	55.0
12	14 11 21	244	14 6.8	150	15.0	54.9
14	14 15 25	243	14 21.8	148	15.0	54.9
16	14 19 28	244	14 36.6	145	15.0	54.9
18	14 23 32	244	14 51.1	142	15.0	54.8
20	14 27 36	244	15 5.3	140	15.0	54.8
22	14 31 40	245	15 19.3	136	14.9	54.8
	June 26.					
0	14 35 45	245	−15 32.9	133	14.9	54.7
2	14 39 50	245	15 46.2	131	14.9	54.7
4	14 43 55	245	15 59.3	127	14.9	54.7
6	14 48 0	246	16 12.0	124	14.9	54.6
8	14 52 6	246	16 24.4	122	14.9	54.6
10	14 56 12	246	16 36.6	118	14.9	54.6
12	15 0 18	246	16 48.4	115	14.9	54.5
14	15 4 24	247	16 59.9	111	14.9	54.5
16	15 8 31	247	17 11.0	109	14.9	54.5
18	15 12 38	247	17 21.9	105	14.9	54.4
20	15 16 45	248	17 32.4	102	14.9	54.4
22	15 20 53	248	17 42.6	99	14.8	54.4
	June 27.					
0	15 25 1	248	−17 52.5	96	14.8	54.4
2	15 29 9	248	18 2.1	92	14.8	54.3
4	15 33 17	249	18 11.3	88	14.8	54.3
6	15 37 26	249	18 20.1	86	14.8	54.3
8	15 41 35	249	18 28.7	82	14.8	54.3
10	15 45 44	249	18 36.9	78	14.8	54.2
12	15 49 53	250	18 44.7	75	14.8	54.2
14	15 54 3	250	18 52.2	71	14.8	54.2
16	15 58 13	250	18 59.3	68	14.8	54.2
18	16 2 23	250	19 6.1	65	14.8	54.2
20	16 6 33	250	19 12.6	60	14.8	54.2
22	16 10 43	251	19 18.6	58	14.8	54.1
	June 28.					
0	16 14 54	251	−19 24.4	53	14.8	54.1
2	16 19 5	251	19 29.7	50	14.8	54.1
4	16 23 16	251	19 34.7	47	14.8	54.1
6	16 27 27	251	19 39.4	43	14.8	54.1
8	16 31 38	252	19 43.7	39	14.8	54.1
10	16 35 50	251	19 47.6	35	14.8	54.1
12	16 40 1	252	19 51.1	32	14.8	54.0
14	16 44 13	252	19 54.3	28	14.7	54.0
16	16 48 25	252	19 57.1	25	14.7	54.0
18	16 52 37	252	19 59.6	20	14.7	54.0
20	16 56 49	252	20 1.6	17	14.7	54.0
22	17 1 1	252	20 3.3	14	14.7	54.0
24	17 5 13		−20 4.7		14.7	54.0

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	June 29.					
h	h m s		° ′		′	″
0	17 5 13	252	−20 4.7	9	14.7	54.0
2	17 9 25	252	20 5.6	6	14.7	54.0
4	17 13 37	252	20 6.2	2	14.7	54.0
6	17 17 49	252	20 6.4	1	14.7	54.0
8	17 22 1	252	20 6.3	5	14.7	54.0
10	17 26 13	252	20 5.8	9	14.7	54.0
12	17 30 25	252	20 4.9	13	14.7	54.0
14	17 34 37	252	20 3.6	16	14.7	54.0
16	17 38 49	252	20 2.0	21	14.7	54.0
18	17 43 1	251	19 59.9	23	14.7	54.0
20	17 47 12	252	19 57.6	28	14.7	54.0
22	17 51 24	251	19 54.8	31	14.7	54.0
	June 30.					
0	17 55 35	252	−19 51.7	35	14.7	54.0
2	17 59 47	251	19 48.2	38	14.7	54.0
4	18 3 58	251	19 44.4	42	14.7	54.0
6	18 8 9	250	19 40.2	46	14.7	54.0
8	18 12 19	251	19 35.6	49	14.7	54.0
10	18 16 30	250	19 30.7	53	14.7	54.0
12	18 20 40	251	19 25.4	56	14.7	54.0
14	18 24 51	249	19 19.8	60	14.7	54.0
16	18 29 0	250	19 13.8	64	14.7	54.0
18	18 33 10	249	19 7.4	67	14.7	54.0
20	18 37 19	250	19 0.7	70	14.7	54.0
22	18 41 29	248	18 53.7	74	14.7	54.0
	July 1.					
0	18 45 37	249	−18 46.3	78	14.7	54.0
2	18 49 46	248	18 38.5	81	14.8	54.0
4	18 53 54	248	18 30.4	84	14.8	54.1
6	18 58 2	248	18 22.0	87	14.8	54.1
8	19 2 10	247	18 13.3	91	14.8	54.1
10	19 6 17	247	18 4.2	94	14.8	54.1
12	19 10 24	247	17 54.8	98	14.8	54.1
14	19 14 31	246	17 45.0	101	14.8	54.1
16	19 18 37	246	17 34.9	103	14.8	54.1
18	19 22 43	245	17 24.6	107	14.8	54.1
20	19 26 48	246	17 13.9	111	14.8	54.2
22	19 30 54	245	17 2.8	113	14.8	54.2
	July 2.					
0	19 34 59	244	−16 51.5	116	14.8	54.2
2	19 39 3	244	16 39.9	120	14.8	54.2
4	19 43 7	244	16 27.9	122	14.8	54.2
6	19 47 11	243	16 15.7	125	14.8	54.2
8	19 51 14	243	16 3.2	129	14.8	54.3
10	19 55 17	243	15 50.3	131	14.8	54.3
12	19 59 20	242	15 37.2	134	14.8	54.3
14	20 3 22	242	15 23.8	137	14.8	54.3
16	20 7 24	242	15 10.1	139	14.8	54.3
18	20 11 26	241	14 56.2	143	14.8	54.4
20	20 15 27	241	14 41.9	145	14.8	54.4
22	20 19 28	240	14 27.4	147	14.9	54.4
24	20 23 28		−14 12.7		14.9	54.4

Full Moon, June 30d 20h 41m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	July 3.					
h	h m s		° ′	′	′	′
0	20 23 28	241	−14 12.7	150	14.9	54.4
2	20 27 29	239	13 57.7	153	14.9	54.4
4	20 31 28	240	13 42.4	155	14.9	54.5
6	20 35 28	239	13 26.9	158	14.9	54.5
8	20 39 27	239	13 11.1	160	14.9	54.5
10	20 43 26	238	12 55.1	163	14.9	54.5
12	20 47 24	239	12 38.8	165	14.9	54.6
14	20 51 23	237	12 22.3	167	14.9	54.6
16	20 55 20	238	12 5.6	169	14.9	54.6
18	20 59 18	237	11 48.7	172	14.9	54.7
20	21 3 15	238	11 31.5	174	14.9	54.7
22	21 7 13	236	11 14.1	175	14.9	54.7
	July 4.					
0	21 11 9	237	−10 56.6	178	14.9	54.8
2	21 15 6	237	10 38.8	180	15.0	54.8
4	21 19 3	236	10 20.8	182	15.0	54.8
6	21 22 59	236	10 2.6	184	15.0	54.9
8	21 26 55	236	9 44.2	186	15.0	54.9
10	21 30 51	235	9 25.6	187	15.0	54.9
12	21 34 46	236	9 6.9	190	15.0	55.0
14	21 38 42	235	8 47.9	191	15.0	55.0
16	21 42 37	236	8 28.8	193	15.0	55.0
18	21 46 33	235	8 9.5	194	15.0	55.1
20	21 50 28	235	7 50.1	196	15.0	55.1
22	21 54 23	235	7 30.5	197	15.1	55.1
	July 5.					
0	21 58 18	235	− 7 10.8	199	15.1	55.2
2	22 2 13	235	6 50.9	201	15.1	55.2
4	22 6 8	235	6 30.8	202	15.1	55.3
6	22 10 3	235	6 10.6	203	15.1	55.3
8	22 13 58	235	5 50.3	204	15.1	55.4
10	22 17 53	235	5 29.9	206	15.1	55.4
12	22 21 48	235	5 9.3	207	15.1	55.4
14	22 25 43	236	4 48.6	208	15.1	55.5
16	22 29 39	235	4 27.8	209	15.2	55.5
18	22 33 34	236	4 6.9	210	15.2	55.6
20	22 37 30	236	3 45.9	211	15.2	55.6
22	22 41 26	236	3 24.8	212	15.2	55.7
	July 6.					
0	22 45 22	236	− 3 3.6	213	15.2	55.7
2	22 49 18	236	2 42.3	214	15.2	55.8
4	22 53 14	237	2 20.9	215	15.2	55.8
6	22 57 11	237	1 59.4	215	15.2	55.9
8	23 1 8	237	1 37.9	216	15.3	55.9
10	23 5 5	238	1 16.3	216	15.3	56.0
12	23 9 3	238	0 54.7	217	15.3	56.0
14	23 13 1	238	0 33.0	217	15.3	56.1
16	23 16 59	239	− 0 11.3	218	15.3	56.1
18	23 20 58	239	+ 0 10.5	219	15.3	56.2
20	23 24 57	240	0 32.4	218	15.3	56.2
22	23 28 57	241	0 54.2	219	15.4	56.3
24	23 32 58		+ 1 16.1		15.4	56.3

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	July 7.					
h	h m s		° ′	′	′	′
0	23 32 58	240	+ 1 16.1	219	15.4	56.3
2	23 36 58	242	1 38.0	219	15.4	56.4
4	23 41 0	242	1 59.9	219	15.4	56.5
6	23 45 2	242	2 21.8	219	15.4	56.5
8	23 49 4	243	2 43.7	219	15.4	56.6
10	23 53 7	244	3 5.6	219	15.5	56.6
12	23 57 11	245	3 27.5	219	15.5	56.7
14	0 1 16	245	3 49.4	218	15.5	56.8
16	0 5 21	246	4 11.2	218	15.5	56.8
18	0 9 27	247	4 33.0	218	15.5	56.9
20	0 13 34	247	4 54.8	217	15.5	56.9
22	0 17 41	249	5 16.5	217	15.6	57.0
	July 8.					
0	0 21 50	249	+ 5 38.2	216	15.6	57.1
2	0 25 59	250	5 59.8	215	15.6	57.1
4	0 30 9	251	6 21.3	215	15.6	57.2
6	0 34 20	252	6 42.8	214	15.6	57.3
8	0 38 32	253	7 4.2	212	15.6	57.3
10	0 42 45	254	7 25.4	212	15.7	57.4
12	0 46 59	255	7 46.6	211	15.7	57.5
14	0 51 14	256	8 7.7	209	15.7	57.5
16	0 55 30	257	8 28.6	208	15.7	57.6
18	0 59 47	259	8 49.4	207	15.7	57.7
20	1 4 6	259	9 10.1	206	15.8	57.7
22	1 8 25	260	9 30.7	204	15.8	57.8
	July 9.					
0	1 12 45	262	+ 9 51.1	202	15.8	57.9
2	1 17 7	263	10 11.3	201	15.8	57.9
4	1 21 30	264	10 31.4	199	15.8	58.0
6	1 25 54	265	10 51.3	197	15.9	58.1
8	1 30 19	267	11 11.0	195	15.9	58.2
10	1 34 46	267	11 30.5	193	15.9	58.2
12	1 39 13	269	11 49.8	191	15.9	58.3
14	1 43 42	271	12 8.9	188	15.9	58.4
16	1 48 13	271	12 27.7	187	15.9	58.4
18	1 52 44	273	12 46.4	183	16.0	58.5
20	1 57 17	275	13 4.7	182	16.0	58.6
22	2 1 52	275	13 22.9	178	16.0	58.6
	July 10.					
0	2 6 27	277	+13 40.7	176	16.0	58.7
2	2 11 4	279	13 58.3	173	16.0	58.8
4	2 15 43	280	14 15.6	170	16.1	58.9
6	2 20 23	281	14 32.6	167	16.1	58.9
8	2 25 4	283	14 49.3	164	16.1	59.0
10	2 29 47	284	15 5.7	161	16.1	59.1
12	2 34 31	285	15 21.8	157	16.1	59.1
14	2 39 16	287	15 37.5	153	16.2	59.2
16	2 44 3	289	15 52.8	151	16.2	59.3
18	2 48 52	289	16 7.9	146	16.2	59.3
20	2 53 41	291	16 22.5	143	16.2	59.4
22	2 58 32	293	16 36.8	138	16.2	59.5
24	3 3 25		+16 50.6		16.2	59.5

Last Quarter, July 3d 17h 6m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	July 11.					
h	h m s		° ′		′	″
0	3 3 25	294	+16 50.6	135	16.2	59.5
2	3 8 19	295	17 4.1	131	16.3	59.6
4	3 13 14	297	17 17.2	126	16.3	59.7
6	3 18 11	298	17 29.8	122	16.3	59.7
8	3 23 9	299	17 42.0	118	16.3	59.8
10	3 28 8	301	17 53.8	113	16.3	59.9
12	3 33 9	302	18 5.1	108	16.4	59.9
14	3 38 11	303	18 15.9	104	16.4	60.0
16	3 43 14	305	18 26.3	99	16.4	60.0
18	3 48 19	305	18 36.2	94	16.4	60.1
20	3 53 24	307	18 45.6	89	16.4	60.1
22	3 58 31	308	18 54.5	84	16.4	60.2
	July 12.					
0	4 3 39	309	+19 2.9	79	16.4	60.3
2	4 8 48	310	19 10.8	74	16.5	60.3
4	4 13 58	312	19 18.2	68	16.5	60.4
6	4 19 10	312	19 25.0	63	16.5	60.4
8	4 24 22	313	19 31.3	57	16.5	60.5
10	4 29 35	314	19 37.0	52	16.5	60.5
12	4 34 49	315	19 42.2	46	16.5	60.6
14	4 40 4	315	19 46.8	41	16.5	60.6
16	4 45 19	317	19 50.9	34	16.6	60.7
18	4 50 36	317	19 54.3	29	16.6	60.7
20	4 55 53	318	19 57.2	24	16.6	60.7
22	5 1 11	318	19 59.6	17	16.6	60.8
	July 13.					
0	5 6 29	319	+20 1.3	11	16.6	60.8
2	5 11 48	319	20 2.4	6	16.6	60.9
4	5 17 7	320	20 3.0	−1	16.6	60.9
6	5 22 27	320	20 2.9	6	16.6	60.9
8	5 27 47	320	20 2.3	13	16.6	61.0
10	5 33 7	321	20 1.0	18	16.6	61.0
12	5 38 28	320	19 59.2	24	16.7	61.0
14	5 43 48	321	19 56.8	31	16.7	61.0
16	5 49 9	321	19 53.7	36	16.7	61.1
18	5 54 30	321	19 50.1	43	16.7	61.1
20	5 59 51	321	19 45.8	48	16.7	61.1
22	6 5 12	320	19 41.0	55	16.7	61.1
	July 14.					
0	6 10 32	321	+19 35.5	60	16.7	61.1
2	6 15 53	320	19 29.5	66	16.7	61.1
4	6 21 13	319	19 22.9	72	16.7	61.1
6	6 26 32	320	19 15.7	78	16.7	61.2
8	6 31 52	319	19 7.9	83	16.7	61.2
10	6 37 11	318	18 59.6	90	16.7	61.2
12	6 42 29	318	18 50.6	94	16.7	61.2
14	6 47 47	317	18 41.2	101	16.7	61.2
16	6 53 4	317	18 31.1	106	16.7	61.2
18	6 58 21	316	18 20.5	111	16.7	61.2
20	7 3 37	315	18 9.4	116	16.7	61.1
22	7 8 52	314	17 57.8	122	16.7	61.1
24	7 14 6		+17 45.6		16.7	61.1

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	July 15.					
h	h m s		° ′		′	″
0	7 14 6	313	+17 45.6	127	16.7	61.1
2	7 19 19	313	17 32.9	132	16.7	61.1
4	7 24 32	312	17 19.7	137	16.7	61.1
6	7 29 44	310	17 6.0	142	16.7	61.1
8	7 34 54	310	16 51.8	146	16.7	61.1
10	7 40 4	309	16 37.2	151	16.7	61.0
12	7 45 13	307	16 22.1	156	16.7	61.0
14	7 50 20	306	16 6.5	160	16.6	61.0
16	7 55 26	306	15 50.5	164	16.6	61.0
18	8 0 32	304	15 34.1	168	16.6	60.9
20	8 5 36	303	15 17.3	173	16.6	60.9
22	8 10 39	302	15 0.0	176	16.6	60.9
	July 16.					
0	8 15 41	300	+14 42.4	181	16.6	60.8
2	8 20 41	300	14 24.3	184	16.6	60.8
4	8 25 41	298	14 5.9	187	16.6	60.7
6	8 30 39	297	13 47.2	191	16.6	60.7
8	8 35 36	295	13 28.1	194	16.6	60.7
10	8 40 31	295	13 8.7	198	16.5	60.6
12	8 45 26	293	12 48.9	200	16.5	60.6
14	8 50 19	292	12 28.9	203	16.5	60.5
16	8 55 11	290	12 8.6	206	16.5	60.5
18	9 0 1	290	11 48.0	209	16.5	60.4
20	9 4 51	288	11 27.1	212	16.5	60.4
22	9 9 39	286	11 5.9	213	16.5	60.3
	July 17.					
0	9 14 25	286	+10 44.6	216	16.4	60.2
2	9 19 11	284	10 23.0	218	16.4	60.2
4	9 23 55	283	10 1.2	220	16.4	60.1
6	9 28 38	282	9 39.2	222	16.4	60.1
8	9 33 20	280	9 17.0	224	16.4	60.0
10	9 38 0	280	8 54.6	226	16.4	59.9
12	9 42 40	278	8 32.0	227	16.3	59.9
14	9 47 18	277	8 9.3	228	16.3	59.8
16	9 51 55	275	7 46.5	230	16.3	59.7
18	9 56 30	275	7 23.5	231	16.3	59.7
20	10 1 5	273	7 0.4	232	16.3	59.6
22	10 5 38	273	6 37.2	232	16.2	59.5
	July 18.					
0	10 10 11	271	+ 6 14.0	234	16.2	59.4
2	10 14 42	270	5 50.6	235	16.2	59.4
4	10 19 12	269	5 27.1	235	16.2	59.3
6	10 23 41	268	5 3.6	235	16.2	59.2
8	10 28 9	267	4 40.1	236	16.1	59.1
10	10 32 36	266	4 16.5	236	16.1	59.1
12	10 37 2	265	3 52.9	237	16.1	59.0
14	10 41 27	265	3 29.2	236	16.1	58.9
16	10 45 52	263	3 5.6	237	16.1	58.8
18	10 50 15	262	2 41.9	237	16.0	58.8
20	10 54 37	261	2 18.2	236	16.0	58.7
22	10 58 58	261	1 54.6	236	16.0	58.6
24	11 3 19		+ 1 31.0		16.0	58.5

New Moon, July 15d 8h 25m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	July 19.					
h	h m s		° ′	′	′	′
0	11 3 19	260	+ 1 31.0	236	16.0	58.5
2	11 7 39	259	1 7.4	235	16.0	58.5
4	11 11 58	258	0 43.9	235	15.9	58.4
6	11 16 16	257	+ 0 20.4	234	15.9	58.3
8	11 20 33	257	− 0 3.0	234	15.9	58.2
10	11 24 50	256	0 26.4	232	15.9	58.1
12	11 29 6	255	0 49.6	232	15.8	58.1
14	11 33 21	255	1 12.8	231	15.8	58.0
16	11 37 36	254	1 35.9	230	15.8	57.9
18	11 41 50	253	1 58.9	229	15.8	57.8
20	11 46 3	253	2 21.8	228	15.8	57.7
22	11 50 16	252	2 44.6	226	15.7	57.7
	July 20.					
0	11 54 28	252	− 3 7.2	226	15.7	57.6
2	11 58 40	251	3 29.8	224	15.7	57.5
4	12 2 51	251	3 52.2	222	15.7	57.4
6	12 7 2	250	4 14.4	221	15.7	57.4
8	12 11 12	250	4 36.5	220	15.6	57.3
10	12 15 22	250	4 58.5	218	15.6	57.2
12	12 19 32	249	5 20.3	216	15.6	57.1
14	12 23 41	248	5 41.9	215	15.6	57.1
16	12 27 49	249	6 3.4	212	15.6	57.0
18	12 31 58	248	6 24.6	211	15.5	56.9
20	12 36 6	247	6 45.7	210	15.5	56.8
22	12 40 13	248	7 6.7	207	15.5	56.8
	July 21.					
0	12 44 21	247	− 7 27.4	205	15.5	56.7
2	12 48 28	247	7 47.9	203	15.5	56.6
4	12 52 35	247	8 8.2	201	15.4	56.5
6	12 56 42	246	8 28.3	199	15.4	56.5
8	13 0 48	247	8 48.2	197	15.4	56.4
10	13 4 55	246	9 7.9	195	15.4	56.3
12	13 9 1	246	9 27.4	192	15.4	56.3
14	13 13 7	246	9 46.6	191	15.3	56.2
16	13 17 13	246	10 5.7	187	15.3	56.1
18	13 21 19	245	10 24.4	186	15.3	56.1
20	13 25 24	246	10 43.0	183	15.3	56.0
22	13 29 30	246	11 1.3	180	15.3	55.9
	July 22.					
0	13 33 36	245	−11 19.3	178	15.3	55.9
2	13 37 41	246	11 37.1	175	15.2	55.8
4	13 41 47	246	11 54.6	173	15.2	55.8
6	13 45 53	245	12 11.9	170	15.2	55.7
8	13 49 58	246	12 28.9	168	15.2	55.6
10	13 54 4	246	12 45.7	165	15.2	55.6
12	13 58 10	245	13 2.2	162	15.2	55.5
14	14 2 15	246	13 18.4	159	15.1	55.5
16	14 6 21	246	13 34.3	157	15.1	55.4
18	14 10 27	246	13 50.0	153	15.1	55.4
20	14 14 33	246	14 5.3	151	15.1	55.3
22	14 18 39	246	14 20.4	151	15.1	55.3
24	14 22 45	246	−14 35.2	148	15.1	55.2

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	July 23.					
h	h m s		° ′	′	′	′
0	14 22 45	246	−14 35.2	145	15.1	55.2
2	14 26 51	247	14 49.7	142	15.1	55.2
4	14 30 58	246	15 3.9	139	15.0	55.1
6	14 35 4	247	15 17.8	136	15.0	55.1
8	14 39 11	247	15 31.4	133	15.0	55.0
10	14 43 18	246	15 44.7	129	15.0	55.0
12	14 47 24	248	15 57.6	127	15.0	54.9
14	14 51 32	247	16 10.3	123	15.0	54.9
16	14 55 39	247	16 22.6	121	15.0	54.9
18	14 59 46	248	16 34.7	117	15.0	54.8
20	15 3 54	248	16 46.4	114	15.0	54.8
22	15 8 2	248	16 57.8	110	14.9	54.7
	July 24.					
0	15 12 10	248	−17 8.8	108	14.9	54.7
2	15 16 18	248	17 19.6	104	14.9	54.7
4	15 20 26	248	17 30.0	101	14.9	54.6
6	15 24 34	249	17 40.1	97	14.9	54.6
8	15 28 43	249	17 49.8	94	14.9	54.6
10	15 32 52	249	17 59.2	91	14.9	54.5
12	15 37 1	249	18 8.3	87	14.9	54.5
14	15 41 10	249	18 17.0	84	14.9	54.5
16	15 45 19	250	18 25.4	80	14.9	54.4
18	15 49 29	250	18 33.4	77	14.9	54.4
20	15 53 39	249	18 41.1	73	14.8	54.4
22	15 57 48	251	18 48.4	70	14.8	54.4
	July 25.					
0	16 1 59	250	−18 55.4	66	14.8	54.3
2	16 6 9	250	19 2.0	63	14.8	54.3
4	16 10 19	251	19 8.3	59	14.8	54.3
6	16 14 30	250	19 14.2	56	14.8	54.3
8	16 18 40	251	19 19.8	52	14.8	54.2
10	16 22 51	251	19 25.0	48	14.8	54.2
12	16 27 2	251	19 29.8	45	14.8	54.2
14	16 31 13	251	19 34.3	41	14.8	54.2
16	16 35 24	251	19 38.4	37	14.8	54.2
18	16 39 35	251	19 42.1	34	14.8	54.2
20	16 43 46	252	19 45.5	31	14.8	54.1
22	16 47 58	251	19 48.6	26	14.8	54.1
	July 26.					
0	16 52 9	252	−19 51.2	23	14.8	54.1
2	16 56 21	251	19 53.5	19	14.8	54.1
4	17 0 32	252	19 55.4	16	14.8	54.1
6	17 4 44	251	19 57.0	12	14.8	54.1
8	17 8 55	252	19 58.2	8	14.8	54.1
10	17 13 7	252	19 59.0	4	14.8	54.1
12	17 17 19	251	19 59.4	1	14.8	54.1
14	17 21 30	252	19 59.5	− 3	14.8	54.1
16	17 25 42	252	19 59.2	6	14.8	54.1
18	17 29 54	251	19 58.6	11	14.8	54.1
20	17 34 5	252	19 57.5	13	14.8	54.1
22	17 38 17	251	19 56.2	18	14.8	54.0
24	17 42 28		−19 54.4		14.8	54.0

First Quarter, July 22d 7h 29m.

G.M.T.	Right Ascension.		Declination.		S.D.		H.P.	
	July 27.							
h	h m s		° ′		″		″	
0	17 42 28	252	−19 54.4	21	14.8	54.0		
2	17 46 40	251	19 52.3	25	14.8	54.0		
4	17 50 51	251	19 49.8	29	14.8	54.0		
6	17 55 2	251	19 46.9	32	14.8	54.0		
8	17 59 13	251	19 43.7	36	14.8	54.1		
10	18 3 24	251	19 40.1	39	14.8	54.1		
12	18 7 35	251	19 36.2	44	14.8	54.1		
14	18 11 46	251	19 31.8	46	14.8	54.1		
16	18 15 57	250	19 27.2	51	14.8	54.1		
18	18 20 7	250	19 22.1	53	14.8	54.1		
20	18 24 17	250	19 16.8	58	14.8	54.1		
22	18 28 27	250	19 11.0	61	14.8	54.1		
	July 28.							
0	18 32 37	250	−19 4.9	64	14.8	54.1		
2	18 36 47	250	18 58.5	68	14.8	54.1		
4	18 40 57	249	18 51.7	72	14.8	54.1		
6	18 45 6	249	18 44.5	75	14.8	54.1		
8	18 49 15	249	18 37.0	78	14.8	54.1		
10	18 53 24	248	18 29.2	82	14.8	54.1		
12	18 57 32	249	18 21.0	85	14.8	54.2		
14	19 1 41	248	18 12.5	88	14.8	54.2		
16	19 5 49	247	18 3.7	92	14.8	54.2		
18	19 9 56	248	17 54.5	95	14.8	54.2		
20	19 14 4	247	17 45.0	99	14.8	54.2		
22	19 18 11	247	17 35.1	101	14.8	54.2		
	July 29.							
0	19 22 18	247	−17 25.0	105	14.8	54.2		
2	19 26 25	246	17 14.5	108	14.8	54.3		
4	19 30 31	246	17 3.7	111	14.8	54.3		
6	19 34 37	246	16 52.6	115	14.8	54.3		
8	19 38 43	245	16 41.1	117	14.8	54.3		
10	19 42 48	245	16 29.4	121	14.8	54.3		
12	19 46 53	245	16 17.3	123	14.8	54.4		
14	19 50 58	245	16 5.0	126	14.8	54.4		
16	19 55 3	244	15 52.4	130	14.8	54.4		
18	19 59 7	244	15 39.4	132	14.9	54.4		
20	20 3 11	243	15 26.2	135	14.9	54.4		
22	20 7 14	243	15 12.7	138	14.9	54.5		
	July 30.							
0	20 11 17	243	−14 58.9	141	14.9	54.5		
2	20 15 20	243	14 44.8	144	14.9	54.5		
4	20 19 23	242	14 30.4	146	14.9	54.5		
6	20 23 25	242	14 15.8	149	14.9	54.6		
8	20 27 27	242	14 0.9	152	14.9	54.6		
10	20 31 29	241	13 45.7	154	14.9	54.6		
12	20 35 30	242	13 30.3	156	14.9	54.6		
14	20 39 32	240	13 14.7	159	14.9	54.7		
16	20 43 32	241	12 58.8	162	14.9	54.7		
18	20 47 33	240	12 42.6	164	14.9	54.7		
20	20 51 33	240	12 26.2	166	14.9	54.8		
22	20 55 33	240	12 9.6	169	14.9	54.8		
24	20 59 33		−11 52.7		15.0	54.8		

G.M.T.	Right Ascension.		Declination.		S.D.		H.P.	
	July 31.							
h	h m s		° ′		″		″	
0	20 59 33	240	−11 52.7	171	15.0	54.8		
2	21 3 33	239	11 35.6	173	15.0	54.8		
4	21 7 32	239	11 18.3	175	15.0	54.9		
6	21 11 31	239	11 0.8	178	15.0	54.9		
8	21 15 30	238	10 43.0	179	15.0	54.9		
10	21 19 28	239	10 25.1	182	15.0	54.9		
12	21 23 27	238	10 6.9	183	15.0	55.0		
14	21 27 25	238	9 48.6	186	15.0	55.0		
16	21 31 23	238	9 30.0	187	15.0	55.0		
18	21 35 21	237	9 11.3	189	15.0	55.1		
20	21 39 18	238	8 52.4	191	15.0	55.1		
22	21 43 16	237	8 33.3	192	15.1	55.1		
	August 1.							
0	21 47 13	238	− 8 14.1	194	15.1	55.2		
2	21 51 11	237	7 54.7	196	15.1	55.2		
4	21 55 8	237	7 35.1	197	15.1	55.2		
6	21 59 5	237	7 15.4	199	15.1	55.3		
8	22 3 2	237	6 55.5	201	15.1	55.3		
10	22 6 59	237	6 35.4	201	15.1	55.3		
12	22 10 56	237	6 15.3	203	15.1	55.4		
14	22 14 53	237	5 55.0	204	15.1	55.4		
16	22 18 50	237	5 34.6	206	15.1	55.5		
18	22 22 47	237	5 14.0	207	15.1	55.5		
20	22 26 44	237	4 53.3	207	15.2	55.5		
22	22 30 41	237	4 32.6	209	15.2	55.6		
	August 2.							
0	22 34 38	237	− 4 11.7	210	15.2	55.6		
2	22 38 35	238	3 50.7	211	15.2	55.6		
4	22 42 33	237	3 29.6	211	15.2	55.7		
6	22 46 30	238	3 8.5	213	15.2	55.7		
8	22 50 28	238	2 47.2	213	15.2	55.8		
10	22 54 26	237	2 25.9	214	15.2	55.8		
12	22 58 23	239	2 4.5	214	15.2	55.8		
14	23 2 22	238	1 43.1	215	15.3	55.9		
16	23 6 20	239	1 21.6	216	15.3	55.9		
18	23 10 19	238	1 0.0	216	15.3	56.0		
20	23 14 17	240	0 38.4	217	15.3	56.0		
22	23 18 17	239	− 0 16.7	217	15.3	56.1		
	August 3.							
0	23 22 16	240	+ 0 5.0	217	15.3	56.1		
2	23 26 16	240	0 26.7	217	15.3	56.1		
4	23 30 16	241	0 48.4	217	15.3	56.2		
6	23 34 17	241	1 10.1	218	15.3	56.2		
8	23 38 18	241	1 31.9	217	15.4	56.3		
10	23 42 19	242	1 53.6	218	15.4	56.3		
12	23 46 21	242	2 15.4	217	15.4	56.4		
14	23 50 23	243	2 37.1	218	15.4	56.4		
16	23 54 26	244	2 58.9	216	15.4	56.5		
18	23 58 30	243	3 20.5	217	15.4	56.5		
20	0 2 33	245	3 42.2	216	15.4	56.6		
22	0 6 38	245	4 3.8	216	15.4	56.6		
24	0 10 43		+ 4 25.4		15.5	56.6		

Full Moon, July 30d 11h 19m.

G.M.T.	Right Ascension.	Declination.	S.D.	H.P.
	August 4.			
h	h m s	° ′	′	′
0	0 10 43	+ 4 25.4	15.5	56.6
	246	215		
2	0 14 49	4 46.9	15.5	56.7
	246	215		
4	0 18 55	5 8.4	15.5	56.7
	247	214		
6	0 23 2	5 29.8	15.5	56.8
	248	213		
8	0 27 10	5 51.1	15.5	56.8
	248	213		
10	0 31 18	6 12.4	15.5	56.9
	249	211		
12	0 35 27	6 33.5	15.5	56.9
	250	211		
14	0 39 37	6 54.6	15.6	57.0
	250	210		
16	0 43 47	7 15.6	15.6	57.0
	252	208		
18	0 47 59	7 36.4	15.6	57.1
	252	207		
20	0 52 11	7 57.1	15.6	57.1
	253	206		
22	0 56 24	8 17.7	15.6	57.2
	254	205		
	August 5.			
0	1 0 38	+ 8 38.2	15.6	57.2
	255	204		
2	1 4 53	8 58.6	15.6	57.3
	256	201		
4	1 9 9	9 18.7	15.6	57.3
	256	201		
6	1 13 25	9 38.8	15.7	57.4
	258	198		
8	1 17 43	9 58.6	15.7	57.4
	258	197		
10	1 22 1	10 18.3	15.7	57.5
	260	195		
12	1 26 21	10 37.8	15.7	57.5
	260	193		
14	1 30 41	10 57.1	15.7	57.6
	262	191		
16	1 35 3	11 16.2	15.7	57.7
	262	189		
18	1 39 25	11 35.1	15.8	57.7
	264	187		
20	1 43 49	11 53.8	15.8	57.8
	265	185		
22	1 48 14	12 12.3	15.8	57.8
	266	183		
	August 6.			
0	1 52 40	+12 30.6	15.8	57.9
	267	180		
2	1 57 7	12 48.6	15.8	57.9
	268	177		
4	2 1 35	13 6.3	15.8	58.0
	269	175		
6	2 6 4	13 23.8	15.8	58.0
	270	172		
8	2 10 34	13 41.0	15.9	58.1
	271	170		
10	2 15 5	13 58.0	15.9	58.1
	273	166		
12	2 19 38	14 14.6	15.9	58.2
	274	164		
14	2 24 12	14 31.0	15.9	58.2
	275	161		
16	2 28 47	14 47.1	15.9	58.3
	276	157		
18	2 33 23	15 2.8	15.9	58.4
	277	155		
20	2 38 0	15 18.3	15.9	58.4
	279	151		
22	2 42 39	15 33.4	16.0	58.5
	279	147		
	August 7.			
0	2 47 18	+15 48.1	16.0	58.5
	281	145		
2	2 51 59	16 2.6	16.0	58.6
	282	140		
4	2 56 41	16 16.6	16.0	58.6
	284	137		
6	3 1 25	16 30.3	16.0	58.7
	284	134		
8	3 6 9	16 43.7	16.0	58.7
	286	129		
10	3 10 55	16 56.6	16.0	58.8
	287	125		
12	3 15 42	17 9.1	16.1	58.8
	288	122		
14	3 20 30	17 21.3	16.1	58.9
	289	117		
16	3 25 19	17 33.0	16.1	58.9
	290	114		
18	3 30 9	17 44.4	16.1	59.0
	291	109		
20	3 35 0	17 55.3	16.1	59.1
	293	104		
22	3 39 53	18 5.7	16.1	59.1
	294	101		
24	3 44 47	+18 15.8	16.1	59.2

G.M.T.	Right Ascension.	Declination.	S.D.	H.P.
	August 8.			
h	h m s	° ′	′	′
0	3 44 47	+18 15.8	16.1	59.2
	294	95		
2	3 49 41	18 25.3	16.2	59.2
	296	92		
4	3 54 37	18 34.5	16.2	59.3
	297	86		
6	3 59 34	18 43.1	16.2	59.3
	298	82		
8	4 4 32	18 51.3	16.2	59.4
	299	77		
10	4 9 31	18 59.0	16.2	59.4
	299	72		
12	4 14 30	19 6.2	16.2	59.5
	301	67		
14	4 19 31	19 12.9	16.2	59.5
	302	62		
16	4 24 33	19 19.1	16.3	59.5
	302	57		
18	4 29 35	19 24.8	16.3	59.6
	304	52		
20	4 34 39	19 30.0	16.3	59.6
	304	47		
22	4 39 43	19 34.7	16.3	59.7
	305	41		
	August 9.			
0	4 44 48	+19 38.8	16.3	59.7
	305	37		
2	4 49 53	19 42.5	16.3	59.8
	307	30		
4	4 55 0	19 45.5	16.3	59.8
	307	26		
6	5 0 7	19 48.1	16.3	59.9
	308	20		
8	5 5 15	19 50.1	16.3	59.9
	308	15		
10	5 10 23	19 51.6	16.4	59.9
	308	9		
12	5 15 31	19 52.5	16.4	60.0
	310	3		
14	5 20 41	19 52.8	16.4	60.0
	309	— 2		
16	5 25 50	19 52.6	16.4	60.1
	310	8		
18	5 31 0	19 51.8	16.4	60.1
	311	13		
20	5 36 11	19 50.5	16.4	60.1
	310	19		
22	5 41 21	19 48.6	16.4	60.2
	311	24		
	August 10.			
0	5 46 32	+19 46.2	16.4	60.2
	311	30		
2	5 51 43	19 43.2	16.4	60.2
	312	36		
4	5 56 55	19 39.6	16.4	60.3
	311	41		
6	6 2 6	19 35.5	16.5	60.3
	311	47		
8	6 7 17	19 30.8	16.5	60.3
	312	52		
10	6 12 29	19 25.6	16.5	60.3
	311	58		
12	6 17 40	19 19.8	16.5	60.4
	312	64		
14	6 22 52	19 13.4	16.5	60.4
	311	69		
16	6 28 3	19 6.5	16.5	60.4
	311	75		
18	6 33 14	18 59.0	16.5	60.4
	310	80		
20	6 38 24	18 51.0	16.5	60.4
	311	85		
22	6 43 35	18 42.5	16.5	60.5
	310	91		
	August 11.			
0	6 48 45	+18 33.4	16.5	60.5
	310	96		
2	6 53 55	18 23.8	16.5	60.5
	309	101		
4	6 59 4	18 13.7	16.5	60.5
	309	107		
6	7 4 13	18 3.0	16.5	60.5
	308	112		
8	7 9 21	17 51.8	16.5	60.5
	308	116		
10	7 14 29	17 40.2	16.5	60.5
	307	122		
12	7 19 36	17 28.0	16.5	60.5
	307	127		
14	7 24 43	17 15.3	16.5	60.5
	306	131		
16	7 29 49	17 2.2	16.5	60.5
	305	137		
18	7 34 54	16 48.5	16.5	60.5
	305	141		
20	7 39 59	16 34.4	16.5	60.5
	304	145		
22	7 45 3	16 19.9	16.5	60.5
	303	150		
24	7 50 6	+16 4.9	16.5	60.5

Last Quarter, Aug. 7d 0h 51m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	August 12.					
h	h m s		° ′		′	″
0	7 50 6	302	+16 4.9	155	16.5	60.5
2	7 55 8	301	15 49.4	159	16.5	60.5
4	8 0 9	301	15 33.5	163	16.5	60.5
6	8 5 10	300	15 17.2	167	16.5	60.5
8	8 10 10	299	15 0.5	171	16.5	60.5
10	8 15 9	298	14 43.4	175	16.5	60.5
12	8 20 7	297	14 25.9	179	16.5	60.5
14	8 25 4	296	14 8.0	182	16.5	60.5
16	8 30 0	295	13 49.8	186	16.5	60.4
18	8 34 55	294	13 31.2	190	16.5	60.4
20	8 39 49	293	13 12.2	193	16.5	60.4
22	8 44 42	293	12 52.9	196	16.5	60.4
	August 13.					
0	8 49 35	291	+12 33.3	199	16.5	60.4
2	8 54 26	290	12 13.4	202	16.5	60.3
4	8 59 16	289	11 53.2	205	16.5	60.3
6	9 4 5	288	11 32.7	208	16.4	60.3
8	9 8 53	288	11 11.9	210	16.4	60.2
10	9 13 41	286	10 50.9	213	16.4	60.2
12	9 18 27	285	10 29.6	215	16.4	60.2
14	9 23 12	284	10 8.1	217	16.4	60.1
16	9 27 56	283	9 46.4	220	16.4	60.1
18	9 32 39	283	9 24.4	222	16.4	60.0
20	9 37 22	281	9 2.2	223	16.4	60.0
22	9 42 3	280	8 39.9	225	16.4	59.9
	August 14.					
0	9 46 43	279	+ 8 17.4	227	16.3	59.9
2	9 51 22	279	7 54.7	229	16.3	59.9
4	9 56 1	277	7 31.8	230	16.3	59.8
6	10 0 38	276	7 8.8	231	16.3	59.8
8	10 5 14	276	6 45.7	232	16.3	59.7
10	10 9 50	274	6 22.5	234	16.3	59.7
12	10 14 24	274	5 59.1	234	16.3	59.6
14	10 18 58	273	5 35.7	235	16.3	59.5
16	10 23 31	271	5 12.2	236	16.2	59.5
18	10 28 2	271	4 48.6	237	16.2	59.4
20	10 32 33	271	4 24.9	237	16.2	59.4
22	10 37 4	269	4 1.2	238	16.2	59.3
	August 15.					
0	10 41 33	268	+ 3 37.4	238	16.2	59.3
2	10 46 1	268	3 13.6	238	16.2	59.2
4	10 50 29	267	2 49.8	238	16.1	59.1
6	10 54 56	266	2 26.0	238	16.1	59.1
8	10 59 22	266	2 2.2	238	16.1	59.0
10	11 3 48	264	1 38.4	238	16.1	58.9
12	11 8 12	264	1 14.6	237	16.1	58.9
14	11 12 36	264	0 50.9	237	16.0	58.8
16	11 17 0	262	0 27.2	237	16.0	58.7
18	11 21 22	262	+ 0 3.5	236	16.0	58.7
20	11 25 44	262	− 0 20.1	235	16.0	58.6
22	11 30 6	260	0 43.6	235	16.0	58.5
24	11 34 26		− 1 7.1		16.0	58.5

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	August 16.					
h	h m s		° ′		′	″
0	11 34 26	260	− 1 7.1	234	16.0	58.5
2	11 38 46	260	1 30.5	233	15.9	58.4
4	11 43 6	259	1 53.8	231	15.9	58.3
6	11 47 25	259	2 16.9	231	15.9	58.2
8	11 51 44	258	2 40.0	230	15.9	58.2
10	11 56 2	257	3 3.0	228	15.9	58.1
12	12 0 19	257	3 25.8	227	15.8	58.0
14	12 4 36	257	3 48.5	225	15.8	58.0
16	12 8 53	256	4 11.0	224	15.8	57.9
18	12 13 9	255	4 33.4	223	15.8	57.8
20	12 17 24	256	4 55.7	221	15.8	57.7
22	12 21 40	255	5 17.8	219	15.7	57.7
	August 17.					
0	12 25 55	254	− 5 39.7	217	15.7	57.6
2	12 30 9	255	6 1.4	216	15.7	57.5
4	12 34 24	254	6 23.0	214	15.7	57.4
6	12 38 38	253	6 44.4	212	15.7	57.4
8	12 42 51	253	7 5.6	209	15.6	57.3
10	12 47 4	254	7 26.5	208	15.6	57.2
12	12 51 18	252	7 47.3	206	15.6	57.2
14	12 55 30	253	8 7.9	203	15.6	57.1
16	12 59 43	252	8 28.2	201	15.6	57.0
18	13 3 55	252	8 48.3	199	15.5	56.9
20	13 8 7	252	9 8.2	197	15.5	56.9
22	13 12 19	252	9 27.9	194	15.5	56.8
	August 18.					
0	13 16 31	252	− 9 47.3	191	15.5	56.7
2	13 20 43	251	10 6.4	190	15.5	56.7
4	13 24 54	251	10 25.4	186	15.4	56.6
6	13 29 5	252	10 44.0	185	15.4	56.5
8	13 33 17	251	11 2.5	181	15.4	56.5
10	13 37 28	251	11 20.6	179	15.4	56.4
12	13 41 39	250	11 38.5	176	15.4	56.3
14	13 45 49	251	11 56.1	173	15.4	56.3
16	13 50 0	251	12 13.4	171	15.3	56.2
18	13 54 11	251	12 30.5	168	15.3	56.1
20	13 58 22	250	12 47.3	165	15.3	56.1
22	14 2 32	251	13 3.8	162	15.3	56.0
	August 19.					
0	14 6 43	251	−13 20.0	159	15.3	55.9
2	14 10 54	250	13 35.9	156	15.3	55.9
4	14 15 4	251	13 51.5	153	15.2	55.8
6	14 19 15	250	14 6.8	150	15.2	55.8
8	14 23 25	251	14 21.8	147	15.2	55.7
10	14 27 36	251	14 36.5	144	15.2	55.7
12	14 31 47	250	14 50.9	140	15.2	55.6
14	14 35 57	251	15 4.9	138	15.2	55.5
16	14 40 8	251	15 18.7	134	15.1	55.5
18	14 44 19	250	15 32.1	132	15.1	55.4
20	14 48 29	251	15 45.3	127	15.1	55.4
22	14 52 40	251	15 58.0	125	15.1	55.3
24	14 56 51		−16 10.5		15.1	55.3

New Moon, Aug. 13d 15h 44m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	August 20.					
h	h m s		° ′		′	″
0	14 56 51	251	−16 10.5	121	15.1	55.3
2	15 1 2	251	16 22.6	119	15.1	55.2
4	15 5 13	251	16 34.5	114	15.1	55.2
6	15 9 24	251	16 45.9	112	15.0	55.1
8	15 13 35	251	16 57.1	107	15.0	55.1
10	15 17 46	251	17 7.8	105	15.0	55.0
12	15 21 57	251	17 18.3	101	15.0	55.0
14	15 26 8	252	17 28.4	98	15.0	55.0
16	15 30 20	251	17 38.2	94	15.0	54.9
18	15 34 31	251	17 47.6	91	15.0	54.9
20	15 38 42	252	17 56.7	87	15.0	54.8
22	15 42 54	251	18 5.4	84	15.0	54.8
	August 21.					
0	15 47 5	252	−18 13.8	80	14.9	54.7
2	15 51 17	252	18 21.8	77	14.9	54.7
4	15 55 29	251	18 29.5	73	14.9	54.7
6	15 59 40	252	18 36.8	69	14.9	54.6
8	16 3 52	252	18 43.7	66	14.9	54.6
10	16 8 4	252	18 50.3	62	14.9	54.6
12	16 12 16	252	18 56.5	59	14.9	54.5
14	16 16 28	252	19 2.4	55	14.9	54.5
16	16 20 40	251	19 7.9	52	14.9	54.5
18	16 24 51	252	19 13.1	48	14.9	54.5
20	16 29 3	252	19 17.9	44	14.9	54.4
22	16 33 15	252	19 22.3	40	14.9	54.4
	August 22.					
0	16 37 27	252	−19 26.3	37	14.8	54.4
2	16 41 39	252	19 30.0	34	14.8	54.4
4	16 45 51	252	19 33.4	29	14.8	54.3
6	16 50 3	252	19 36.3	26	14.8	54.3
8	16 54 15	252	19 38.9	23	14.8	54.3
10	16 58 27	252	19 41.2	18	14.8	54.3
12	17 2 39	252	19 43.0	15	14.8	54.3
14	17 6 51	252	19 44.5	12	14.8	54.3
16	17 11 3	252	19 45.7	7	14.8	54.2
18	17 15 15	251	19 46.4	4	14.8	54.2
20	17 19 26	252	19 46.8	0	14.8	54.2
22	17 23 38	252	19 46.8	3	14.8	54.2
	August 23.					
0	17 27 50	251	−19 46.5	7	14.8	54.2
2	17 32 1	252	19 45.8	11	14.8	54.2
4	17 36 13	251	19 44.7	14	14.8	54.2
6	17 40 24	251	19 43.3	18	14.8	54.2
8	17 44 35	251	19 41.5	21	14.8	54.2
10	17 48 46	251	19 39.4	26	14.8	54.2
12	17 52 57	251	19 36.8	28	14.8	54.2
14	17 57 8	251	19 34.0	33	14.8	54.2
16	18 1 19	251	19 30.7	36	14.8	54.2
18	18 5 30	250	19 27.1	39	14.8	54.2
20	18 9 40	250	19 23.2	44	14.8	54.2
22	18 13 50	250	19 18.8	46	14.8	54.2
24	18 18 0		−19 14.2		14.8	54.2

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	August 24.					
h	h m s		° ′		′	″
0	18 18 0	250	−19 14.2	50	14.8	54.2
2	18 22 10	250	19 9.2	54	14.8	54.2
4	18 26 20	250	19 3.8	58	14.8	54.2
6	18 30 30	249	18 58.0	60	14.8	54.2
8	18 34 39	249	18 52.0	65	14.8	54.2
10	18 38 48	249	18 45.5	67	14.8	54.2
12	18 42 57	249	18 38.8	71	14.8	54.2
14	18 47 6	249	18 31.7	75	14.8	54.2
16	18 51 15	248	18 24.2	78	14.8	54.2
18	18 55 23	248	18 16.4	81	14.8	54.2
20	18 59 31	248	18 8.3	85	14.8	54.3
22	19 3 39	248	17 59.8	88	14.8	54.3
	August 25.					
0	19 7 47	247	−17 51.0	91	14.8	54.3
2	19 11 54	248	17 41.9	95	14.8	54.3
4	19 16 2	247	17 32.4	98	14.8	54.3
6	19 20 9	246	17 22.6	101	14.8	54.3
8	19 24 15	247	17 12.5	104	14.8	54.4
10	19 28 22	246	17 2.1	108	14.8	54.4
12	19 32 28	246	16 51.3	110	14.8	54.4
14	19 36 34	246	16 40.3	114	14.9	54.4
16	19 40 40	246	16 28.9	117	14.9	54.4
18	19 44 46	245	16 17.2	120	14.9	54.5
20	19 48 51	245	16 5.2	123	14.9	54.5
22	19 52 56	245	15 52.9	126	14.9	54.5
	August 26.					
0	19 57 1	244	−15 40.3	128	14.9	54.5
2	20 1 5	245	15 27.5	132	14.9	54.6
4	20 5 10	244	15 14.3	135	14.9	54.6
6	20 9 14	243	15 0.8	137	14.9	54.6
8	20 13 17	244	14 47.1	141	14.9	54.6
10	20 17 21	243	14 33.0	143	14.9	54.7
12	20 21 24	243	14 18.7	145	14.9	54.7
14	20 25 27	243	14 4.2	149	14.9	54.7
16	20 29 30	243	13 49.3	151	14.9	54.8
18	20 33 33	243	13 34.2	154	15.0	54.8
20	20 37 36	242	13 18.8	156	15.0	54.8
22	20 41 38	242	13 3.2	159	15.0	54.8
	August 27.					
0	20 45 40	242	−12 47.3	162	15.0	54.9
2	20 49 42	241	12 31.1	163	15.0	54.9
4	20 53 43	242	12 14.8	167	15.0	54.9
6	20 57 45	241	11 58.1	168	15.0	55.0
8	21 1 46	241	11 41.3	171	15.0	55.0
10	21 5 47	241	11 24.2	173	15.0	55.0
12	21 9 48	241	11 6.9	176	15.0	55.1
14	21 13 49	241	10 49.3	177	15.0	55.1
16	21 17 50	241	10 31.6	180	15.1	55.2
18	21 21 51	240	10 13.6	182	15.1	55.2
20	21 25 51	241	9 55.4	184	15.1	55.2
22	21 29 52	240	9 37.0	185	15.1	55.3
24	21 33 52		− 9 18.5		15.1	55.3

First Quarter, Aug. 20d 22h 52m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	August 28.					
h	h m s		° ′		′	″
0	21 33 52	240	−9 18.5	188	15.1	55.3
2	21 37 52	240	8 59.7	190	15.1	55.3
4	21 41 52	240	8 40.7	191	15.1	55.4
6	21 45 52	240	8 21.6	193	15.1	55.4
8	21 49 52	240	8 2.3	195	15.1	55.5
10	21 53 52	240	7 42.8	197	15.1	55.5
12	21 57 52	240	7 23.1	198	15.2	55.5
14	22 1 52	240	7 3.3	200	15.2	55.6
16	22 5 52	240	6 43.3	201	15.2	55.6
18	22 9 52	240	6 23.2	202	15.2	55.7
20	22 13 52	240	6 3.0	204	15.2	55.7
22	22 17 52	240	5 42.6	206	15.2	55.7
	August 29.					
0	22 21 52	241	−5 22.0	206	15.2	55.8
2	22 25 53	240	5 1.4	208	15.2	55.8
4	22 29 53	240	4 40.6	209	15.2	55.9
6	22 33 53	241	4 19.7	210	15.3	55.9
8	22 37 54	241	3 58.7	211	15.3	55.9
10	22 41 55	241	3 37.6	212	15.3	56.0
12	22 45 56	241	3 16.4	213	15.3	56.0
14	22 49 57	241	2 55.1	214	15.3	56.1
16	22 53 58	241	2 33.7	214	15.3	56.1
18	22 57 59	242	2 12.3	216	15.3	56.1
20	23 2 1	242	1 50.7	215	15.3	56.2
22	23 6 3	242	1 29.2	217	15.3	56.2
	August 30.					
0	23 10 5	243	−1 7.5	217	15.4	56.3
2	23 14 8	243	0 45.8	217	15.4	56.3
4	23 18 11	243	0 24.1	216	15.4	56.3
6	23 22 14	243	−0 2.3	218	15.4	56.4
8	23 26 17	244	+0 19.5	218	15.4	56.4
10	23 30 21	244	0 41.3	218	15.4	56.5
12	23 34 25	245	1 3.1	219	15.4	56.5
14	23 38 30	245	1 25.0	218	15.4	56.6
16	23 42 35	246	1 46.8	219	15.4	56.6
18	23 46 41	246	2 8.7	218	15.5	56.6
20	23 50 47	246	2 30.5	218	15.5	56.7
22	23 54 53	247	2 52.3	218	15.5	56.7
	August 31.					
0	23 59 0	247	+3 14.1	218	15.5	56.8
2	0 3 7	248	3 35.9	217	15.5	56.8
4	0 7 15	249	3 57.6	217	15.5	56.8
6	0 11 24	249	4 19.3	216	15.5	56.9
8	0 15 33	250	4 40.9	215	15.5	56.9
10	0 19 43	250	5 2.4	215	15.6	57.0
12	0 23 53	251	5 23.9	214	15.6	57.0
14	0 28 4	251	5 45.3	213	15.6	57.1
16	0 32 15	253	6 6.6	212	15.6	57.1
18	0 36 28	253	6 27.8	211	15.6	57.1
20	0 40 41	253	6 48.9	210	15.6	57.2
22	0 44 54	254	7 9.9	208	15.6	57.2
24	0 49 8		+7 30.7		15.6	57.3

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	September 1.					
h	h m s		° ′		′	″
0	0 49 8	256	+ 7 30.7	208	15.6	57.3
2	0 53 24	255	7 51.5	206	15.6	57.3
4	0 57 39	257	8 12.1	204	15.7	57.3
6	1 1 56	257	8 32.5	203	15.7	57.4
8	1 6 13	258	8 52.8	202	15.7	57.4
10	1 10 31	259	9 13.0	200	15.7	57.5
12	1 14 50	260	9 33.0	198	15.7	57.5
14	1 19 10	261	9 52.8	196	15.7	57.5
16	1 23 31	261	10 12.4	194	15.7	57.6
18	1 27 52	262	10 31.8	192	15.7	57.6
20	1 32 14	264	10 51.0	191	15.7	57.7
22	1 36 38	264	11 10.1	188	15.7	57.7
	September 2.					
0	1 41 2	265	+11 28.9	185	15.8	57.7
2	1 45 27	266	11 47.4	184	15.8	57.8
4	1 49 53	266	12 5.8	180	15.8	57.8
6	1 54 19	268	12 23.8	179	15.8	57.9
8	1 58 47	269	12 41.7	176	15.8	57.9
10	2 3 16	270	12 59.3	173	15.8	57.9
12	2 7 46	270	13 16.6	170	15.8	58.0
14	2 12 16	272	13 33.6	167	15.8	58.0
16	2 16 48	272	13 50.3	165	15.8	58.0
18	2 21 20	274	14 6.8	161	15.9	58.1
20	2 25 54	274	14 22.9	159	15.9	58.1
22	2 30 28	276	14 38.8	155	15.9	58.2
	September 3.					
0	2 35 4	276	+14 54.3	152	15.9	58.2
2	2 39 40	277	15 9.5	148	15.9	58.2
4	2 44 17	279	15 24.3	146	15.9	58.3
6	2 48 56	279	15 38.9	141	15.9	58.3
8	2 53 35	280	15 53.0	138	15.9	58.3
10	2 58 15	281	16 6.8	135	15.9	58.4
12	3 2 56	282	16 20.3	130	15.9	58.4
14	3 7 38	284	16 33.3	127	16.0	58.4
16	3 12 22	284	16 46.0	123	16.0	58.5
18	3 17 6	284	16 58.3	119	16.0	58.5
20	3 21 50	286	17 10.2	114	16.0	58.5
22	3 26 36	287	17 21.6	111	16.0	58.6
	September 4.					
0	3 31 23	288	+17 32.7	107	16.0	58.6
2	3 36 11	288	17 43.4	102	16.0	58.6
4	3 40 59	289	17 53.6	98	16.0	58.7
6	3 45 48	291	18 3.4	93	16.0	58.7
8	3 50 39	291	18 12.7	89	16.0	58.7
10	3 55 30	291	18 21.6	85	16.0	58.8
12	4 0 21	293	18 30.1	79	16.1	58.8
14	4 5 14	293	18 38.0	76	16.1	58.8
16	4 10 7	294	18 45.6	70	16.1	58.9
18	4 15 1	295	18 52.6	66	16.1	58.9
20	4 19 56	295	18 59.2	61	16.1	58.9
22	4 24 51	296	19 5.3	56	16.1	59.0
24	4 29 47		+19 10.9		16.1	59.0

Full Moon, Aug. 29d 1h 3m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	h m s		° ′		′	″
September 5.						
h						
0	4 29 47	297	+19 10.9	51	16.1	59.0
2	4 34 44	297	19 16.0	47	16.1	59.0
4	4 39 41	298	19 20.7	41	16.1	59.1
6	4 44 39	299	19 24.8	36	16.1	59.1
8	4 49 38	298	19 28.4	32	16.1	59.1
10	4 54 36	300	19 31.6	26	16.1	59.1
12	4 59 36	299	19 34.2	21	16.2	59.2
14	5 4 35	300	19 36.3	15	16.2	59.2
16	5 9 35	301	19 37.8	11	16.2	59.2
18	5 14 36	301	19 38.9	6	16.2	59.3
20	5 19 37	301	19 39.5	0	16.2	59.3
22	5 24 38	301	19 39.5	5	16.2	59.3
September 6.						
0	5 29 39	302	+19 39.0	10	16.2	59.3
2	5 34 41	301	19 38.0	16	16.2	59.4
4	5 39 42	302	19 36.4	20	16.2	59.4
6	5 44 44	302	19 34.4	26	16.2	59.4
8	5 49 46	302	19 31.8	32	16.2	59.4
10	5 54 48	302	19 28.6	36	16.2	59.4
12	5 59 50	302	19 25.0	42	16.2	59.5
14	6 4 52	302	19 20.8	46	16.2	59.5
16	6 9 54	302	19 16.2	52	16.2	59.5
18	6 14 56	302	19 11.0	58	16.2	59.5
20	6 19 58	302	19 5.2	62	16.2	59.5
22	6 25 0	301	18 59.0	68	16.3	59.6
September 7.						
0	6 30 1	301	+18 52.2	72	16.3	59.6
2	6 35 2	301	18 45.0	78	16.3	59.6
4	6 40 3	301	18 37.2	82	16.3	59.6
6	6 45 4	300	18 29.0	88	16.3	59.6
8	6 50 4	300	18 20.2	93	16.3	59.6
10	6 55 4	300	18 10.9	97	16.3	59.6
12	7 0 4	299	18 1.2	102	16.3	59.7
14	7 5 3	299	17 51.0	108	16.3	59.7
16	7 10 2	298	17 40.2	111	16.3	59.7
18	7 15 0	298	17 29.1	117	16.3	59.7
20	7 19 58	297	17 17.4	121	16.3	59.7
22	7 24 55	297	17 5.3	126	16.3	59.7
September 8.						
0	7 29 52	296	+16 52.7	130	16.3	59.7
2	7 34 48	295	16 39.7	134	16.3	59.7
4	7 39 43	295	16 26.3	139	16.3	59.7
6	7 44 38	295	16 12.4	143	16.3	59.7
8	7 49 33	293	15 58.1	147	16.3	59.7
10	7 54 26	293	15 43.4	152	16.3	59.7
12	7 59 19	292	15 28.2	155	16.3	59.7
14	8 4 11	292	15 12.7	159	16.3	59.7
16	8 9 3	291	14 56.8	163	16.3	59.7
18	8 13 54	290	14 40.5	167	16.3	59.7
20	8 18 44	289	14 23.8	171	16.3	59.7
22	8 23 33	289	14 6.7	174	16.3	59.7
24	8 28 22		+13 49.3		16.3	59.7

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	h m s		° ′		′	″
September 9.						
h						
0	8 28 22	288	+13 49.3	177	16.3	59.7
2	8 33 10	287	13 31.6	181	16.3	59.7
4	8 37 57	286	13 13.5	184	16.3	59.7
6	8 42 43	286	12 55.1	188	16.3	59.7
8	8 47 29	285	12 36.3	190	16.3	59.7
10	8 52 14	284	12 17.3	194	16.3	59.6
12	8 56 58	283	11 57.9	196	16.3	59.6
14	9 1 41	282	11 38.3	199	16.3	59.6
16	9 6 23	282	11 18.4	202	16.3	59.6
18	9 11 5	281	10 58.2	204	16.3	59.6
20	9 15 46	280	10 37.8	207	16.3	59.6
22	9 20 26	279	10 17.1	210	16.2	59.5
September 10.						
0	9 25 5	279	+ 9 56.1	211	16.2	59.5
2	9 29 44	277	9 35.0	214	16.2	59.5
4	9 34 21	277	9 13.6	215	16.2	59.5
6	9 38 58	277	8 52.1	218	16.2	59.4
8	9 43 35	275	8 30.3	219	16.2	59.4
10	9 48 10	275	8 8.4	222	16.2	59.4
12	9 52 45	274	7 46.2	222	16.2	59.4
14	9 57 19	273	7 24.0	225	16.2	59.3
16	10 1 52	273	7 1.5	225	16.2	59.3
18	10 6 25	272	6 39.0	227	16.2	59.3
20	10 10 57	271	6 16.3	229	16.2	59.2
22	10 15 28	270	5 53.4	229	16.2	59.2
September 11.						
0	10 19 58	270	+ 5 30.5	230	16.1	59.2
2	10 24 28	270	5 7.5	231	16.1	59.1
4	10 28 58	268	4 44.4	232	16.1	59.1
6	10 33 26	268	4 21.2	233	16.1	59.0
8	10 37 54	268	3 57.9	233	16.1	59.0
10	10 42 22	266	3 34.6	234	16.1	59.0
12	10 46 48	266	3 11.2	234	16.1	58.9
14	10 51 14	266	2 47.8	234	16.1	58.9
16	10 55 40	265	2 24.4	235	16.1	58.8
18	11 0 5	265	2 0.9	234	16.0	58.8
20	11 4 30	264	1 37.5	235	16.0	58.7
22	11 8 54	263	1 14.0	234	16.0	58.7
September 12.						
0	11 13 17	263	+ 0 50.6	235	16.0	58.7
2	11 17 40	263	0 27.1	234	16.0	58.6
4	11 22 3	262	+ 0 3.7	233	16.0	58.6
6	11 26 25	262	− 0 19.6	233	16.0	58.5
8	11 30 47	261	0 42.9	232	16.0	58.4
10	11 35 8	261	1 6.1	232	15.9	58.4
12	11 39 29	260	1 29.3	231	15.9	58.3
14	11 43 49	260	1 52.4	230	15.9	58.3
16	11 48 9	260	2 15.4	229	15.9	58.2
18	11 52 29	259	2 38.3	229	15.9	58.2
20	11 56 48	259	3 1.2	227	15.9	58.1
22	12 1 7	259	3 23.9	225	15.8	58.1
24	12 5 26		− 3 46.4		15.8	58.0

Last Quarter, Sept. 5d 7h 5m.
New Moon, Sept. 12d 0h 52m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	September 13.					
h	h m s		° ′		′	″
0	12 5 26	258	− 3 46.4	225	15.8	58.0
2	12 9 44	258	4 8.9	223	15.8	57.9
4	12 14 2	258	4 31.2	222	15.8	57.9
6	12 18 20	258	4 53.4	220	15.8	57.8
8	12 22 38	257	5 15.4	219	15.8	57.8
10	12 26 55	257	5 37.3	217	15.8	57.7
12	12 31 12	257	5 59.0	216	15.7	57.7
14	12 35 29	257	6 20.6	213	15.7	57.6
16	12 39 46	256	6 41.9	212	15.7	57.5
18	12 44 2	257	7 3.1	209	15.7	57.5
20	12 48 19	256	7 24.0	208	15.7	57.4
22	12 52 35	256	7 44.8	206	15.7	57.3
	September 14.					
0	12 56 51	255	− 8 5.4	203	15.6	57.3
2	13 1 6	256	8 25.7	202	15.6	57.2
4	13 5 22	256	8 45.9	199	15.6	57.2
6	13 9 38	255	9 5.8	196	15.6	57.1
8	13 13 53	256	9 25.4	195	15.6	57.0
10	13 18 9	255	9 44.9	192	15.6	57.0
12	13 22 24	255	10 4.1	189	15.5	56.9
14	13 26 39	255	10 23.0	187	15.5	56.9
16	13 30 54	255	10 41.7	184	15.5	56.8
18	13 35 9	255	11 0.1	182	15.5	56.7
20	13 39 24	255	11 18.3	179	15.5	56.7
22	13 43 39	255	11 36.2	176	15.5	56.6
	September 15.					
0	13 47 54	255	−11 53.8	174	15.4	56.6
2	13 52 9	254	12 11.2	170	15.4	56.5
4	13 56 23	255	12 28.2	168	15.4	56.4
6	14 0 38	255	12 45.0	165	15.4	56.4
8	14 4 53	255	13 1.5	162	15.4	56.3
10	14 9 8	254	13 17.7	158	15.4	56.3
12	14 13 22	255	13 33.5	156	15.3	56.2
14	14 17 37	255	13 49.1	153	15.3	56.1
16	14 21 52	254	14 4.4	149	15.3	56.1
18	14 26 6	255	14 19.3	147	15.3	56.0
20	14 30 21	255	14 34.0	143	15.3	56.0
22	14 34 36	254	14 48.3	140	15.3	55.9
	September 16.					
0	14 38 50	255	−15 2.3	136	15.2	55.9
2	14 43 5	255	15 15.9	134	15.2	55.8
4	14 47 20	255	15 29.3	130	15.2	55.7
6	14 51 35	254	15 42.3	127	15.2	55.7
8	14 55 49	255	15 55.0	123	15.2	55.6
10	15 0 4	255	16 7.3	120	15.2	55.6
12	15 4 19	255	16 19.3	116	15.2	55.5
14	15 8 34	254	16 30.9	113	15.1	55.5
16	15 12 48	255	16 42.2	110	15.1	55.4
18	15 17 3	255	16 53.2	106	15.1	55.4
20	15 21 18	254	17 3.8	103	15.1	55.3
22	15 25 32	255	17 14.1	99	15.1	55.3
24	15 29 47		−17 24.0		15.1	55.2

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	September 17.					
h	h m s		° ′		′	″
0	15 29 47	255	−17 24.0	95	15.1	55.2
2	15 34 2	255	17 33.5	92	15.1	55.2
4	15 38 17	254	17 42.7	89	15.1	55.1
6	15 42 31	255	17 51.6	84	15.0	55.1
8	15 46 46	254	18 0.0	82	15.0	55.1
10	15 51 0	255	18 8.2	77	15.0	55.0
12	15 55 15	255	18 15.9	74	15.0	55.0
14	15 59 30	254	18 23.3	70	15.0	54.9
16	16 3 44	254	18 30.3	67	15.0	54.9
18	16 7 58	255	18 37.0	63	15.0	54.9
20	16 12 13	254	18 43.3	59	15.0	54.8
22	16 16 27	254	18 49.2	56	15.0	54.8
	September 18.					
0	16 20 41	255	−18 54.8	52	14.9	54.8
2	16 24 56	254	19 0.0	48	14.9	54.7
4	16 29 10	254	19 4.8	44	14.9	54.7
6	16 33 24	254	19 9.2	41	14.9	54.7
8	16 37 38	254	19 13.3	37	14.9	54.6
10	16 41 52	253	19 17.0	34	14.9	54.6
12	16 46 5	254	19 20.4	30	14.9	54.6
14	16 50 19	253	19 23.4	26	14.9	54.5
16	16 54 32	254	19 26.0	22	14.9	54.5
18	16 58 46	253	19 28.2	19	14.9	54.5
20	17 2 59	253	19 30.1	15	14.9	54.5
22	17 7 12	253	19 31.6	11	14.9	54.4
	September 19.					
0	17 11 25	253	−19 32.7	8	14.9	54.4
2	17 15 38	252	19 33.5	4	14.8	54.4
4	17 19 50	253	19 33.9	0	14.8	54.4
6	17 24 3	252	19 33.9	3	14.8	54.4
8	17 28 15	252	19 33.6	7	14.8	54.3
10	17 32 27	252	19 32.9	11	14.8	54.3
12	17 36 39	252	19 31.8	14	14.8	54.3
14	17 40 51	251	19 30.4	18	14.8	54.3
16	17 45 2	251	19 28.6	21	14.8	54.3
18	17 49 13	251	19 26.5	25	14.8	54.3
20	17 53 24	251	19 24.0	29	14.8	54.3
22	17 57 35	251	19 21.1	32	14.8	54.3
	September 20.					
0	18 1 46	250	−19 17.9	36	14.8	54.3
2	18 5 56	250	19 14.3	39	14.8	54.3
4	18 10 6	250	19 10.4	43	14.8	54.2
6	18 14 16	250	19 6.1	46	14.8	54.2
8	18 18 26	250	19 1.5	50	14.8	54.2
10	18 22 36	249	18 56.5	53	14.8	54.2
12	18 26 45	249	18 51.2	57	14.8	54.2
14	18 30 54	248	18 45.5	60	14.8	54.2
16	18 35 2	249	18 39.5	63	14.8	54.2
18	18 39 11	248	18 33.2	67	14.8	54.2
20	18 43 19	248	18 26.5	70	14.8	54.3
22	18 47 27	248	18 19.5	74	14.8	54.3
24	18 51 35		−18 12.1		14.8	54.3

First Quarter, Sept. 19d 16h 55m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	September 21.					
h	h m s		° ′		′	″
0	18 51 35	247	−18 12.1	77	14.8	54.3
2	18 55 42	247	18 4.4	80	14.8	54.3
4	18 59 49	247	17 56.4	84	14.8	54.3
6	19 3 56	247	17 48.0	87	14.8	54.3
8	19 8 3	246	17 39.3	90	14.8	54.3
10	19 12 9	246	17 30.3	93	14.8	54.3
12	19 16 15	246	17 21.0	97	14.8	54.3
14	19 20 21	245	17 11.3	99	14.8	54.4
16	19 24 26	246	17 1.4	103	14.8	54.4
18	19 28 32	245	16 51.1	106	14.8	54.4
20	19 32 37	244	16 40.5	109	14.9	54.4
22	19 36 41	245	16 29.6	112	14.9	54.4
	September 22.					
0	19 40 46	244	−16 18.4	115	14.9	54.4
2	19 44 50	244	16 6.9	118	14.9	54.5
4	19 48 54	244	15 55.1	121	14.9	54.5
6	19 52 58	244	15 43.0	124	14.9	54.5
8	19 57 2	243	15 30.6	127	14.9	54.5
10	20 1 5	243	15 17.9	130	14.9	54.6
12	20 5 8	243	15 4.9	132	14.9	54.6
14	20 9 11	243	14 51.7	136	14.9	54.6
16	20 13 14	242	14 38.1	138	14.9	54.6
18	20 17 16	243	14 24.3	141	14.9	54.7
20	20 21 19	242	14 10.2	143	14.9	54.7
22	20 25 21	242	13 55.9	147	14.9	54.7
	September 23.					
0	20 29 23	241	−13 41.2	149	14.9	54.8
2	20 33 24	242	13 26.3	151	15.0	54.8
4	20 37 26	241	13 11.2	154	15.0	54.8
6	20 41 27	242	12 55.8	157	15.0	54.9
8	20 45 29	241	12 40.1	159	15.0	54.9
10	20 49 30	241	12 24.2	162	15.0	54.9
12	20 53 31	241	12 8.0	164	15.0	55.0
14	20 57 32	241	11 51.6	166	15.0	55.0
16	21 1 33	240	11 35.0	169	15.0	55.1
18	21 5 33	241	11 18.1	171	15.0	55.1
20	21 9 34	240	11 1.0	173	15.1	55.1
22	21 13 34	241	10 43.7	176	15.1	55.2
	September 24.					
0	21 17 35	241	−10 26.1	177	15.1	55.2
2	21 21 36	240	10 8.4	180	15.1	55.3
4	21 25 36	240	9 50.4	182	15.1	55.3
6	21 29 36	241	9 32.2	184	15.1	55.4
8	21 33 37	240	9 13.8	186	15.1	55.4
10	21 37 37	241	8 55.2	187	15.1	55.4
12	21 41 38	240	8 36.5	190	15.1	55.5
14	21 45 38	241	8 17.5	192	15.2	55.5
16	21 49 39	240	7 58.3	193	15.2	55.6
18	21 53 39	241	7 39.0	195	15.2	55.6
20	21 57 40	241	7 19.5	197	15.2	55.7
22	22 1 41	241	6 59.8	198	15.2	55.7
24	22 5 42		− 6 40.0		15.2	55.8

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	September 25.					
h	h m s		° ′		′	″
0	22 5 42	241	− 6 40.0	200	15.2	55.8
2	22 9 43	241	6 20.0	202	15.2	55.8
4	22 13 44	242	5 59.8	203	15.3	55.9
6	22 17 46	241	5 39.5	204	15.3	55.9
8	22 21 47	242	5 19.1	206	15.3	56.0
10	22 25 49	242	4 58.5	207	15.3	56.0
12	22 29 51	242	4 37.8	209	15.3	56.1
14	22 33 53	243	4 16.9	209	15.3	56.1
16	22 37 56	242	3 56.0	211	15.3	56.2
18	22 41 58	243	3 34.9	212	15.3	56.2
20	22 46 1	244	3 13.7	213	15.4	56.3
22	22 50 5	243	2 52.4	213	15.4	56.3
	September 26.					
0	22 54 8	244	− 2 31.1	215	15.4	56.4
2	22 58 12	245	2 9.6	215	15.4	56.4
4	23 2 17	245	1 48.1	217	15.4	56.5
6	23 6 22	245	1 26.4	216	15.4	56.5
8	23 10 27	245	1 4.8	218	15.4	56.6
10	23 14 32	246	0 43.0	218	15.5	56.7
12	23 18 38	247	− 0 21.2	218	15.5	56.7
14	23 22 45	247	+ 0 0.6	219	15.5	56.8
16	23 26 52	247	0 22.5	219	15.5	56.8
18	23 30 59	248	0 44.4	220	15.5	56.9
20	23 35 7	248	1 6.4	220	15.5	56.9
22	23 39 15	249	1 28.4	219	15.5	57.0
	September 27.					
0	23 43 24	250	+ 1 50.3	220	15.6	57.0
2	23 47 34	250	2 12.3	220	15.6	57.1
4	23 51 44	250	2 34.3	219	15.6	57.1
6	23 55 54	252	2 56.2	220	15.6	57.2
8	0 0 6	252	3 18.2	219	15.6	57.2
10	0 4 18	252	3 40.1	219	15.6	57.3
12	0 8 30	254	4 2.0	218	15.6	57.3
14	0 12 44	253	4 23.8	218	15.7	57.4
16	0 16 57	255	4 45.6	217	15.7	57.4
18	0 21 12	255	5 7.3	217	15.7	57.5
20	0 25 27	257	5 29.0	215	15.7	57.5
22	0 29 44	256	5 50.5	215	15.7	57.6
	September 28.					
0	0 34 0	258	+ 6 12.0	214	15.7	57.6
2	0 38 18	258	6 33.4	213	15.7	57.7
4	0 42 36	259	6 54.7	211	15.7	57.7
6	0 46 55	260	7 15.8	211	15.8	57.7
8	0 51 15	261	7 36.9	209	15.8	57.8
10	0 55 36	262	7 57.8	208	15.8	57.8
12	0 59 58	262	8 18.6	206	15.8	57.9
14	1 4 20	264	8 39.2	205	15.8	57.9
16	1 8 44	264	8 59.7	203	15.8	58.0
18	1 13 8	265	9 20.0	201	15.8	58.0
20	1 17 33	266	9 40.1	199	15.8	58.0
22	1 21 59	267	10 0.0	198	15.9	58.1
24	1 26 26		+10 19.8		15.9	58.1

Full Moon, Sept. 27d 13h 57m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	h m s		° ′		′	′
September 29.						
h						
0	1 26 26	267	+10 19.8	195	15.9	58.1
2	1 30 53	269	10 39.3	193	15.9	58.2
4	1 35 22	270	10 58.6	191	15.9	58.2
6	1 39 52	270	11 17.7	189	15.9	58.2
8	1 44 22	272	11 36.6	186	15.9	58.3
10	1 48 54	272	11 55.2	184	15.9	58.3
12	1 53 26	273	12 13.6	181	15.9	58.4
14	1 57 59	275	12 31.7	179	15.9	58.4
16	2 2 34	275	12 49.6	175	15.9	58.4
18	2 7 9	276	13 7.1	173	16.0	58.5
20	2 11 45	277	13 24.4	170	16.0	58.5
22	2 16 22	278	13 41.4	167	16.0	58.5
September 30.						
0	2 21 0	279	+13 58.1	163	16.0	58.6
2	2 25 39	280	14 14.4	161	16.0	58.6
4	2 30 19	280	14 30.5	157	16.0	58.6
6	2 34 59	282	14 46.2	153	16.0	58.7
8	2 39 41	283	15 1.5	150	16.0	58.7
10	2 44 24	283	15 16.5	147	16.0	58.7
12	2 49 7	285	15 31.2	143	16.0	58.7
14	2 53 52	285	15 45.5	139	16.0	58.8
16	2 58 37	286	15 59.4	135	16.0	58.8
18	3 3 23	287	16 12.9	131	16.1	58.8
20	3 8 10	288	16 26.0	128	16.1	58.8
22	3 12 58	288	16 38.8	123	16.1	58.9
October 1.						
0	3 17 46	290	+16 51.1	119	16.1	58.9
2	3 22 36	290	17 3.0	115	16.1	58.9
4	3 27 26	291	17 14.5	111	16.1	58.9
6	3 32 17	292	17 25.6	106	16.1	59.0
8	3 37 9	292	17 36.2	102	16.1	59.0
10	3 42 1	293	17 46.4	97	16.1	59.0
12	3 46 54	294	17 56.1	93	16.1	59.0
14	3 51 48	294	18 5.4	88	16.1	59.0
16	3 56 42	296	18 14.2	84	16.1	59.0
18	4 1 38	295	18 22.6	79	16.1	59.1
20	4 6 33	296	18 30.5	74	16.1	59.1
22	4 11 29	297	18 37.9	69	16.1	59.1
October 2.						
0	4 16 26	297	+18 44.8	64	16.1	59.1
2	4 21 23	298	18 51.2	60	16.1	59.1
4	4 26 21	298	18 57.2	54	16.1	59.1
6	4 31 19	298	19 2.6	50	16.1	59.2
8	4 36 17	299	19 7.6	45	16.1	59.2
10	4 41 16	299	19 12.1	39	16.2	59.2
12	4 46 15	300	19 16.0	35	16.2	59.2
14	4 51 15	300	19 19.5	29	16.2	59.2
16	4 56 15	300	19 22.4	24	16.2	59.2
18	5 1 15	300	19 24.8	19	16.2	59.2
20	5 6 15	300	19 26.7	14	16.2	59.2
22	5 11 15	300	19 28.1	9	16.2	59.2
24	5 16 15		+19 29.0		16.2	59.2

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	h m s		° ′		′	′
October 3.						
0	5 16 15	301	+19 29.0	4	16.2	59.2
2	5 21 16	300	19 29.4	2	16.2	59.2
4	5 26 16	301	19 29.2	7	16.2	59.2
6	5 31 17	300	19 28.5	11	16.2	59.3
8	5 36 17	301	19 27.4	17	16.2	59.3
10	5 41 18	300	19 25.7	23	16.2	59.3
12	5 46 18	300	19 23.4	27	16.2	59.3
14	5 51 18	300	19 20.7	32	16.2	59.3
16	5 56 18	300	19 17.5	38	16.2	59.3
18	6 1 18	299	19 13.7	42	16.2	59.3
20	6 6 17	299	19 9.5	48	16.2	59.3
22	6 11 16	299	19 4.7	53	16.2	59.3
October 4.						
0	6 16 15	299	+18 59.4	57	16.2	59.3
2	6 21 14	298	18 53.7	63	16.2	59.3
4	6 26 12	298	18 47.4	67	16.2	59.3
6	6 31 10	297	18 40.7	73	16.2	59.3
8	6 36 7	297	18 33.4	77	16.2	59.3
10	6 41 4	296	18 25.7	82	16.2	59.3
12	6 46 0	296	18 17.5	87	16.2	59.3
14	6 50 56	295	18 8.8	91	16.2	59.3
16	6 55 51	295	17 59.7	96	16.2	59.2
18	7 0 46	294	17 50.1	101	16.2	59.2
20	7 5 40	294	17 40.0	105	16.2	59.2
22	7 10 34	293	17 29.5	110	16.2	59.2
October 5.						
0	7 15 27	292	+17 18.5	114	16.2	59.2
2	7 20 19	291	17 7.1	118	16.2	59.2
4	7 25 10	291	16 55.3	123	16.2	59.2
6	7 30 1	291	16 43.0	126	16.2	59.2
8	7 34 52	289	16 30.4	131	16.2	59.2
10	7 39 41	289	16 17.3	135	16.2	59.2
12	7 44 30	288	16 3.8	139	16.2	59.2
14	7 49 18	287	15 49.9	143	16.1	59.2
16	7 54 5	286	15 35.6	147	16.1	59.1
18	7 58 51	286	15 20.9	150	16.1	59.1
20	8 3 37	285	15 5.9	154	16.1	59.1
22	8 8 22	284	14 50.5	158	16.1	59.1
October 6.						
0	8 13 6	283	+14 34.7	161	16.1	59.1
2	8 17 49	283	14 18.6	165	16.1	59.1
4	8 22 32	282	14 2.1	168	16.1	59.1
6	8 27 14	281	13 45.3	171	16.1	59.1
8	8 31 55	280	13 28.2	175	16.1	59.0
10	8 36 35	279	13 10.7	177	16.1	59.0
12	8 41 14	279	12 53.0	180	16.1	59.0
14	8 45 53	278	12 35.0	184	16.1	59.0
16	8 50 31	277	12 16.6	186	16.1	59.0
18	8 55 8	276	11 58.0	189	16.1	59.0
20	8 59 44	275	11 39.1	191	16.1	58.9
22	9 4 19	275	11 20.0	195	16.1	58.9
24	9 8 54		+11 0.5		16.1	58.9

Last Quarter, Oct. 4d 12h 54m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	October 7.					
h	h m s		° ′	′	′	′
0	9 8 54	274	+11 0.5	196	16.1	58.9
2	9 13 28	273	10 40.9	199	16.1	58.9
4	9 18 1	273	10 21.0	201	16.1	58.9
6	9 22 34	271	10 0.9	203	16.1	58.8
8	9 27 5	271	9 40.6	206	16.0	58.8
10	9 31 36	271	9 20.0	207	16.0	58.8
12	9 36 7	269	8 59.3	210	16.0	58.8
14	9 40 36	269	8 38.3	211	16.0	58.7
16	9 45 5	269	8 17.2	213	16.0	58.7
18	9 49 34	267	7 55.9	214	16.0	58.7
20	9 54 1	267	7 34.5	216	16.0	58.7
22	9 58 28	267	7 12.9	218	16.0	58.6
	October 8.					
0	10 2 55	265	+ 6 51.1	219	16.0	58.6
2	10 7 20	265	6 29.2	220	16.0	58.6
4	10 11 45	265	6 7.2	221	16.0	58.6
6	10 16 10	264	5 45.1	222	16.0	58.5
8	10 20 34	264	5 22.9	224	16.0	58.5
10	10 24 58	263	5 0.5	224	16.0	58.5
12	10 29 21	262	4 38.1	225	16.0	58.4
14	10 33 43	262	4 15.6	225	15.9	58.4
16	10 38 5	261	3 53.1	227	15.9	58.4
18	10 42 26	261	3 30.4	227	15.9	58.3
20	10 46 47	261	3 7.7	227	15.9	58.3
22	10 51 8	260	2 45.0	228	15.9	58.3
	October 9.					
0	10 55 28	260	+ 2 22.2	228	15.9	58.2
2	10 59 48	259	1 59.4	228	15.9	58.2
4	11 4 7	259	1 36.6	228	15.9	58.2
6	11 8 26	258	1 13.8	228	15.9	58.1
8	11 12 44	258	0 51.0	228	15.9	58.1
10	11 17 2	258	0 28.2	228	15.8	58.1
12	11 21 20	258	+ 0 5.4	228	15.8	58.0
14	11 25 38	257	− 0 17.4	227	15.8	58.0
16	11 29 55	257	0 40.1	227	15.8	57.9
18	11 34 12	257	1 2.8	227	15.8	57.9
20	11 38 29	256	1 25.5	225	15.8	57.9
22	11 42 45	257	1 48.0	226	15.8	57.8
	October 10.					
0	11 47 2	256	− 2 10.6	224	15.8	57.8
2	11 51 18	256	2 33.0	224	15.8	57.8
4	11 55 34	255	2 55.4	222	15.8	57.7
6	11 59 49	256	3 17.6	222	15.7	57.7
8	12 4 5	255	3 39.8	220	15.7	57.6
10	12 8 20	256	4 1.8	220	15.7	57.6
12	12 12 36	255	4 23.8	218	15.7	57.5
14	12 16 51	255	4 45.6	217	15.7	57.5
16	12 21 6	255	5 7.3	216	15.7	57.4
18	12 25 21	255	5 28.9	214	15.7	57.4
20	12 29 36	254	5 50.3	212	15.7	57.4
22	12 33 50	256	6 11.5	211	15.6	57.3
24	12 38 5		− 6 32.6		15.6	57.3

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	October 11.					
h	h m s		° ′	′	′	′
0	12 38 5	255	− 6 32.6	209	15.6	57.3
2	12 42 20	254	6 53.5	208	15.6	57.2
4	12 46 34	255	7 14.3	206	15.6	57.2
6	12 50 49	255	7 34.9	203	15.6	57.1
8	12 55 4	254	7 55.2	202	15.6	57.1
10	12 59 18	255	8 15.4	200	15.6	57.0
12	13 3 33	255	8 35.4	198	15.6	57.0
14	13 7 48	254	8 55.2	196	15.5	56.9
16	13 12 2	255	9 14.8	193	15.5	56.9
18	13 16 17	255	9 34.1	191	15.5	56.8
20	13 20 32	255	9 53.2	189	15.5	56.8
22	13 24 47	255	10 12.1	187	15.5	56.7
	October 12.					
0	13 29 2	255	−10 30.8	184	15.5	56.7
2	13 33 17	255	10 49.2	181	15.5	56.6
4	13 37 32	255	11 7.3	179	15.4	56.6
6	13 41 47	255	11 25.2	176	15.4	56.6
8	13 46 2	255	11 42.8	174	15.4	56.5
10	13 50 17	255	12 0.2	171	15.4	56.5
12	13 54 32	256	12 17.3	168	15.4	56.4
14	13 58 48	255	12 34.1	165	15.4	56.4
16	14 3 3	256	12 50.6	163	15.4	56.3
18	14 7 19	256	13 6.9	159	15.4	56.3
20	14 11 35	255	13 22.8	157	15.3	56.2
22	14 15 50	256	13 38.5	153	15.3	56.2
	October 13.					
0	14 20 6	256	−13 53.8	151	15.3	56.1
2	14 24 22	256	14 8.9	147	15.3	56.1
4	14 28 38	256	14 23.6	144	15.3	56.0
6	14 32 54	257	14 38.0	141	15.3	56.0
8	14 37 11	256	14 52.1	138	15.3	55.9
10	14 41 27	256	15 5.9	135	15.2	55.9
12	14 45 43	257	15 19.4	131	15.2	55.8
14	14 50 0	256	15 32.5	128	15.2	55.8
16	14 54 16	257	15 45.3	124	15.2	55.7
18	14 58 33	257	15 57.7	121	15.2	55.7
20	15 2 50	256	16 9.8	118	15.2	55.6
22	15 7 6	257	16 21.6	115	15.2	55.6
	October 14.					
0	15 11 23	257	−16 33.1	110	15.2	55.5
2	15 15 40	257	16 44.1	108	15.1	55.5
4	15 19 57	257	16 54.9	103	15.1	55.4
6	15 24 14	256	17 5.2	101	15.1	55.4
8	15 28 30	257	17 15.3	96	15.1	55.4
10	15 32 47	257	17 24.9	93	15.1	55.3
12	15 37 4	257	17 34.2	90	15.1	55.3
14	15 41 21	257	17 43.2	86	15.1	55.2
16	15 45 38	257	17 51.8	82	15.1	55.2
18	15 49 55	257	18 0.0	78	15.1	55.2
20	15 54 12	257	18 7.8	75	15.0	55.1
22	15 58 29	256	18 15.3	71	15.0	55.1
24	16 2 45		−18 22.4		15.0	55.0

New Moon, Oct. 11d 12h 50m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	October 15.					
h	h m s		° ′	′	′	′
0	16 2 45	257	−18 22.4	68	15.0	55.0
2	16 7 2	257	18 29.2	64	15.0	55.0
4	16 11 19	256	18 35.6	60	15.0	55.0
6	16 15 35	257	18 41.6	56	15.0	54.9
8	16 19 52	256	18 47.2	52	15.0	54.9
10	16 24 8	256	18 52.4	49	15.0	54.9
12	16 28 24	256	18 57.3	45	15.0	54.8
14	16 32 40	256	19 1.8	42	15.0	54.8
16	16 36 56	256	19 6.0	37	14.9	54.7
18	16 41 12	256	19 9.7	34	14.9	54.7
20	16 45 28	255	19 13.1	31	14.9	54.7
22	16 49 43	255	19 16.2	26	14.9	54.6
	October 16.					
0	16 53 58	255	−19 18.8	23	14.9	54.6
2	16 58 13	255	19 21.1	19	14.9	54.6
4	17 2 28	255	19 23.0	15	14.9	54.6
6	17 6 43	255	19 24.5	11	14.9	54.5
8	17 10 58	254	19 25.6	8	14.9	54.5
10	17 15 12	254	19 26.4	4	14.9	54.5
12	17 19 26	254	19 26.8	1	14.9	54.5
14	17 23 40	253	19 26.9	−3	14.9	54.4
16	17 27 53	253	19 26.6	7	14.9	54.4
18	17 32 6	253	19 25.9	11	14.8	54.4
20	17 36 19	253	19 24.8	14	14.8	54.4
22	17 40 32	252	19 23.4	18	14.8	54.4
	October 17.					
0	17 44 44	252	−19 21.6	21	14.8	54.3
2	17 48 56	252	19 19.5	25	14.8	54.3
4	17 53 8	251	19 17.0	28	14.8	54.3
6	17 57 19	252	19 14.2	32	14.8	54.3
8	18 1 31	250	19 11.0	36	14.8	54.3
10	18 5 41	251	19 7.4	39	14.8	54.3
12	18 9 52	250	19 3.5	43	14.8	54.3
14	18 14 2	250	18 59.2	46	14.8	54.2
16	18 18 12	249	18 54.6	49	14.8	54.2
18	18 22 21	249	18 49.7	53	14.8	54.2
20	18 26 30	249	18 44.4	57	14.8	54.2
22	18 30 39	248	18 38.7	60	14.8	54.2
	October 18.					
0	18 34 47	248	−18 32.7	63	14.8	54.2
2	18 38 55	248	18 26.4	66	14.8	54.2
4	18 43 3	247	18 19.8	70	14.8	54.2
6	18 47 10	247	18 12.8	73	14.8	54.2
8	18 51 17	247	18 5.5	76	14.8	54.2
10	18 55 24	246	17 57.9	80	14.8	54.2
12	18 59 30	246	17 49.9	83	14.8	54.2
14	19 3 36	245	17 41.6	86	14.8	54.2
16	19 7 41	246	17 33.0	89	14.8	54.2
18	19 11 47	244	17 24.1	92	14.8	54.2
20	19 15 51	245	17 14.9	96	14.8	54.2
22	19 19 56	244	17 5.3	98	14.8	54.2
24	19 24 0		−16 55.5		14.8	54.2

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	October 19.					
h	h m s		° ′	′	′	′
0	19 24 0	244	−16 55.5	102	14.8	54.2
2	19 28 4	243	16 45.3	104	14.8	54.3
4	19 32 7	243	16 34.9	108	14.8	54.3
6	19 36 10	243	16 24.1	110	14.8	54.3
8	19 40 13	242	16 13.1	113	14.8	54.3
10	19 44 15	242	16 1.8	117	14.8	54.3
12	19 48 17	242	15 50.1	119	14.8	54.3
14	19 52 19	241	15 38.2	122	14.8	54.4
16	19 56 20	242	15 26.0	125	14.8	54.4
18	20 0 22	240	15 13.5	127	14.8	54.4
20	20 4 22	241	15 0.8	131	14.9	54.4
22	20 8 23	240	14 47.7	133	14.9	54.4
	October 20.					
0	20 12 23	240	−14 34.4	135	14.9	54.5
2	20 16 23	240	14 20.9	139	14.9	54.5
4	20 20 23	240	14 7.0	141	14.9	54.5
6	20 24 23	239	13 52.9	143	14.9	54.5
8	20 28 22	239	13 38.6	147	14.9	54.6
10	20 32 21	239	13 23.9	148	14.9	54.6
12	20 36 20	239	13 9.1	151	14.9	54.6
14	20 40 19	239	12 54.0	154	14.9	54.7
16	20 44 18	238	12 38.6	156	14.9	54.7
18	20 48 16	238	12 23.0	158	14.9	54.7
20	20 52 14	238	12 7.2	161	15.0	54.8
22	20 56 12	238	11 51.1	163	15.0	54.8
	October 21.					
0	21 0 10	238	−11 34.8	165	15.0	54.8
2	21 4 8	238	11 18.3	168	15.0	54.9
4	21 8 6	238	11 1.5	170	15.0	54.9
6	21 12 4	238	10 44.5	172	15.0	55.0
8	21 16 2	237	10 27.3	174	15.0	55.0
10	21 19 59	238	10 9.9	176	15.0	55.1
12	21 23 57	237	9 52.3	178	15.0	55.1
14	21 27 54	238	9 34.5	180	15.1	55.1
16	21 31 52	238	9 16.5	182	15.1	55.2
18	21 35 50	237	8 58.3	184	15.1	55.2
20	21 39 47	238	8 39.9	186	15.1	55.3
22	21 43 45	238	8 21.3	188	15.1	55.3
	October 22.					
0	21 47 43	238	− 8 2.5	189	15.1	55.4
2	21 51 41	238	7 43.6	192	15.1	55.4
4	21 55 39	238	7 24.4	193	15.1	55.5
6	21 59 37	238	7 5.1	194	15.2	55.5
8	22 3 35	239	6 45.7	197	15.2	55.6
10	22 7 34	239	6 26.0	198	15.2	55.7
12	22 11 33	239	6 6.2	199	15.2	55.7
14	22 15 32	239	5 46.3	201	15.2	55.8
16	22 19 31	239	5 26.2	202	15.2	55.8
18	22 23 30	240	5 6.0	204	15.3	55.9
20	22 27 30	240	4 45.6	205	15.3	55.9
22	22 31 30	240	4 25.1	206	15.3	56.0
24	22 35 30		− 4 4.5		15.3	56.1

First Quarter, Oct. 19d 12h 29m.

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	October 23.					
h	h m s		° ′		′	′
0	22 35 30	241	− 4 4.5	208	15.3	56.1
2	22 39 31	241	3 43.7	208	15.3	56.1
4	22 43 32	242	3 22.9	210	15.3	56.2
6	22 47 34	241	3 1.9	211	15.3	56.2
8	22 51 35	243	2 40.8	212	15.4	56.3
10	22 55 38	243	2 19.6	212	15.4	56.4
12	22 59 41	243	1 58.4	214	15.4	56.4
14	23 3 44	244	−1 37.0	215	15.4	56.5
16	23 7 48	244	1 15.5	215	15.4	56.6
18	23 11 52	245	0 54.0	216	15.5	56.6
20	23 15 57	245	0 32.4	216	15.5	56.7
22	23 20 2	246	− 0 10.8	217	15.5	56.7
	October 24.					
0	23 24 8	247	+ 0 10.9	218	15.5	56.8
2	23 28 15	247	0 32.7	218	15.5	56.9
4	23 32 22	248	0 54.5	218	15.5	56.9
6	23 36 30	248	1 16.3	219	15.6	57.0
8	23 40 38	250	1 38.2	219	15.6	57.1
10	23 44 48	250	2 0.1	219	15.6	57.1
12	23 48 58	250	2 22.0	219	15.6	57.2
14	23 53 8	252	2 43.9	219	15.6	57.3
16	23 57 20	252	3 5.8	219	15.6	57.3
18	0 1 32	253	3 27.7	219	15.7	57.4
20	0 5 45	254	3 49.6	218	15.7	57.5
22	0 9 59	255	4 11.4	219	15.7	57.5
	October 25.					
0	0 14 14	256	+ 4 33.3	217	15.7	57.6
2	0 18 30	256	4 55.0	218	15.7	57.6
4	0 22 46	258	5 16.8	216	15.8	57.7
6	0 27 4	258	5 38.4	216	15.8	57.8
8	0 31 22	259	6 0.0	216	15.8	57.8
10	0 35 41	260	6 21.6	214	15.8	57.9
12	0 40 1	262	6 43.0	213	15.8	58.0
14	0 44 23	262	7 4.3	213	15.8	58.0
16	0 48 45	263	7 25.6	211	15.9	58.1
18	0 53 8	264	7 46.7	210	15.9	58.2
20	0 57 32	266	8 7.7	209	15.9	58.2
22	1 1 58	266	8 28.6	207	15.9	58.3
	October 26.					
0	1 6 24	267	+ 8 49.3	206	15.9	58.3
2	1 10 51	269	9 9.9	204	15.9	58.4
4	1 15 20	269	9 30.3	202	16.0	58.5
6	1 19 49	271	9 50.5	201	16.0	58.5
8	1 24 20	272	10 10.6	199	16.0	58.6
10	1 28 52	273	10 30.5	196	16.0	58.6
12	1 33 25	274	10 50.1	195	16.0	58.7
14	1 37 59	275	11 9.6	192	16.0	58.7
16	1 42 34	276	11 28.8	190	16.0	58.8
18	1 47 10	277	11 47.8	187	16.1	58.8
20	1 51 47	279	12 6.5	185	16.1	58.9
22	1 56 26	280	12 25.0	182	16.1	59.0
24	2 1 6		+12 43.2		16.1	59.0

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	October 27.					
h	h m s		° ′		′	′
0	2 1 6	280	+12 43.2	180	16.1	59.0
2	2 5 46	282	13 1.2	176	16.1	59.1
4	2 10 28	283	13 18.8	174	16.1	59.1
6	2 15 11	284	13 36.2	171	16.1	59.1
8	2 19 55	286	13 53.3	167	16.2	59.2
10	2 24 41	286	14 10.0	164	16.2	59.2
12	2 29 27	288	14 26.4	161	16.2	59.3
14	2 34 15	288	14 42.5	157	16.2	59.3
16	2 39 3	290	14 58.2	153	16.2	59.4
18	2 43 53	291	15 13.5	150	16.2	59.4
20	2 48 44	291	15 28.5	146	16.2	59.4
22	2 53 35	293	15 43.1	143	16.2	59.5
	October 28.					
0	2 58 28	294	+15 57.4	138	16.2	59.5
2	3 3 22	295	16 11.2	134	16.2	59.5
4	3 8 17	296	16 24.6	130	16.3	59.6
6	3 13 13	296	16 37.6	126	16.3	59.6
8	3 18 9	298	16 50.2	121	16.3	59.6
10	3 23 7	298	17 2.3	117	16.3	59.7
12	3 28 5	300	17 14.0	113	16.3	59.7
14	3 33 5	300	17 25.3	108	16.3	59.7
16	3 38 5	301	17 36.1	103	16.3	59.7
18	3 43 6	302	17 46.4	99	16.3	59.8
20	3 48 8	302	17 56.3	93	16.3	59.8
22	3 53 10	303	18 5.6	89	16.3	59.8
	October 29.					
0	3 58 13	304	+18 14.5	84	16.3	59.8
2	4 3 17	305	18 22.9	79	16.3	59.8
4	4 8 22	305	18 30.8	74	16.3	59.9
6	4 13 27	305	18 38.2	69	16.3	59.9
8	4 18 32	306	18 45.1	63	16.3	59.9
10	4 23 38	307	18 51.4	59	16.3	59.9
12	4 28 45	307	18 57.3	53	16.4	59.9
14	4 33 52	307	19 2.6	48	16.4	59.9
16	4 38 59	307	19 7.4	42	16.4	59.9
18	4 44 6	308	19 11.6	37	16.4	59.9
20	4 49 14	308	19 15.3	32	16.4	59.9
22	4 54 22	308	19 18.5	27	16.4	59.9
	October 30.					
0	4 59 30	309	+19 21.2	21	16.4	59.9
2	5 4 39	308	19 23.3	15	16.4	59.9
4	5 9 47	308	19 24.8	11	16.4	59.9
6	5 14 55	309	19 25.9	4	16.4	59.9
8	5 20 4	308	19 26.3	0	16.4	59.9
10	5 25 12	308	19 26.3	6	16.4	59.9
12	5 30 20	308	19 25.7	12	16.4	59.9
14	5 35 28	308	19 24.5	17	16.4	59.9
16	5 40 36	308	19 22.8	22	16.4	59.9
18	5 45 44	307	19 20.6	27	16.3	59.9
20	5 50 51	307	19 17.9	33	16.3	59.9
22	5 55 58	306	19 14.6	39	16.3	59.9
24	6 1 4		+19 10.7		16.3	59.9

Full Moon, Oct. 27d 2h 9m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	October 31.					
h	h m s		° ′	′	′	′
0	6 1 4	307	+19 10.7	43	16.3	59.9
2	6 6 11	305	19 6.4	49	16.3	59.9
4	6 11 16	305	19 1.5	54	16.3	59.8
6	6 16 21	305	18 56.1	59	16.3	59.8
8	6 21 26	304	18 50.2	64	16.3	59.8
10	6 26 30	303	18 43.8	69	16.3	59.8
12	6 31 33	303	18 36.9	74	16.3	59.8
14	6 36 36	302	18 29.5	80	16.3	59.8
16	6 41 38	301	18 21.5	84	16.3	59.7
18	6 46 39	301	18 13.1	88	16.3	59.7
20	6 51 40	300	18 4.3	94	16.3	59.7
22	6 56 40	298	17 54.9	98	16.3	59.7
	November 1.					
0	7 1 38	299	+17 45.1	103	16.3	59.6
2	7 6 37	297	17 34.8	108	16.3	59.6
4	7 11 34	296	17 24.0	111	16.3	59.6
6	7 16 30	296	17 12.9	117	16.3	59.6
8	7 21 26	294	17 1.2	120	16.2	59.5
10	7 26 20	294	16 49.2	125	16.2	59.5
12	7 31 14	292	16 36.7	129	16.2	59.5
14	7 36 6	292	16 23.8	133	16.2	59.5
16	7 40 58	291	16 10.5	137	16.2	59.4
18	7 45 49	289	15 56.8	141	16.2	59.4
20	7 50 38	289	15 42.7	145	16.2	59.4
22	7 55 27	288	15 28.2	148	16.2	59.3
	November 2.					
0	8 0 15	287	+15 13.4	152	16.2	59.3
2	8 5 2	285	14 58.2	156	16.2	59.3
4	8 9 47	285	14 42.6	159	16.2	59.2
6	8 14 32	283	14 26.7	162	16.2	59.2
8	8 19 15	283	14 10.5	166	16.2	59.2
10	8 23 58	282	13 53.9	168	16.1	59.1
12	8 28 40	280	13 37.1	172	16.1	59.1
14	8 33 20	280	13 19.9	175	16.1	59.1
16	8 38 0	278	13 2.4	178	16.1	59.0
18	8 42 38	278	12 44.6	181	16.1	59.0
20	8 47 16	277	12 26.5	183	16.1	59.0
22	8 51 53	275	12 8.2	186	16.1	58.9
	November 3.					
0	8 56 28	275	+11 49.6	188	16.1	58.9
2	9 1 3	273	11 30.8	191	16.1	58.8
4	9 5 36	272	11 11.7	193	16.0	58.8
6	9 10 9	272	10 52.4	196	16.0	58.8
8	9 14 41	271	10 32.8	197	16.0	58.7
10	9 19 12	270	10 13.1	200	16.0	58.7
12	9 23 42	269	9 53.1	202	16.0	58.7
14	9 28 11	268	9 32.9	203	16.0	58.6
16	9 32 39	267	9 12.6	205	16.0	58.6
18	9 37 6	267	8 52.1	208	16.0	58.5
20	9 41 33	265	8 31.3	208	16.0	58.5
22	9 45 58	265	8 10.5	211	16.0	58.5
24	9 50 23		+ 7 49.4		15.9	58.4

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	November 4.					
h	h m s		° ′	′	′	′
0	9 50 23	264	+ 7 49.4	211	15.9	58.4
2	9 54 47	264	7 28.3	213	15.9	58.4
4	9 59 11	262	7 7.0	215	15.9	58.3
6	10 3 33	262	6 45.5	215	15.9	58.3
8	10 7 55	261	6 24.0	217	15.9	58.3
10	10 12 16	261	6 2.3	217	15.9	58.2
12	10 16 37	260	5 40.6	219	15.9	58.2
14	10 20 57	259	5 18.7	219	15.9	58.1
16	10 25 16	258	4 56.8	220	15.9	58.1
18	10 29 34	258	4 34.8	221	15.8	58.1
20	10 33 52	258	4 12.7	222	15.8	58.0
22	10 38 10	256	3 50.5	222	15.8	58.0
	November 5.					
0	10 42 26	257	+ 3 28.3	222	15.8	57.9
2	10 46 43	256	3 6.1	223	15.8	57.9
4	10 50 59	255	2 43.8	223	15.8	57.9
6	10 55 14	255	2 21.5	223	15.8	57.8
8	10 59 29	254	1 59.2	223	15.8	57.8
10	11 3 43	254	1 36.9	224	15.7	57.7
12	11 7 57	254	1 14.5	223	15.7	57.7
14	11 12 11	253	0 52.2	224	15.7	57.7
16	11 16 24	253	0 29.8	223	15.7	57.6
18	11 20 37	252	+ 0 7.5	223	15.7	57.6
20	11 24 49	253	− 0 14.8	222	15.7	57.5
22	11 29 2	252	0 37.0	222	15.7	57.5
	November 6.					
0	11 33 14	251	− 0 59.2	222	15.7	57.4
2	11 37 25	252	1 21.4	221	15.7	57.4
4	11 41 37	251	1 43.5	220	15.7	57.4
6	11 45 48	251	2 5.5	220	15.6	57.3
8	11 49 59	251	2 27.5	219	15.6	57.3
10	11 54 10	251	2 49.4	218	15.6	57.2
12	11 58 21	250	3 11.2	218	15.6	57.2
14	12 2 31	251	3 33.0	216	15.6	57.2
16	12 6 42	250	3 54.6	215	15.6	57.1
18	12 10 52	250	4 16.1	214	15.6	57.1
20	12 15 2	250	4 37.5	213	15.6	57.0
22	12 19 12	250	4 58.8	212	15.6	57.0
	November 7.					
0	12 23 22	250	− 5 20.0	210	15.5	57.0
2	12 27 32	250	5 41.0	209	15.5	56.9
4	12 31 42	250	6 1.9	208	15.5	56.9
6	12 35 52	251	6 22.7	205	15.5	56.8
8	12 40 3	250	6 43.2	205	15.5	56.8
10	12 44 13	250	7 3.7	203	15.5	56.7
12	12 48 23	250	7 24.0	201	15.5	56.7
14	12 52 33	250	7 44.1	199	15.5	56.7
16	12 56 43	251	8 4.0	197	15.5	56.6
18	13 0 54	250	8 23.7	196	15.4	56.6
20	13 5 4	251	8 43.3	193	15.4	56.5
22	13 9 15	250	9 2.6	192	15.4	56.5
24	13 13 25		− 9 21.8		15.4	56.5

Last Quarter, Nov. 2d 19h 35m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	November 8.					
h	h m s		° ′		′	″
0	13 13 25	251	− 9 21.8	189	15.4	56.5
2	13 17 36	251	9 40.7	188	15.4	56.4
4	13 21 47	251	9 59.5	185	15.4	56.4
6	13 25 58	251	10 18.0	183	15.4	56.3
8	13 30 9	252	10 36.3	180	15.4	56.3
10	13 34 21	251	10 54.3	178	15.4	56.3
12	13 38 32	252	11 12.1	176	15.3	56.2
14	13 42 44	252	11 29.7	173	15.3	56.2
16	13 46 56	252	11 47.0	171	15.3	56.1
18	13 51 8	252	12 4.1	168	15.3	56.1
20	13 55 20	253	12 20.9	166	15.3	56.1
22	13 59 33	252	12 37.5	163	15.3	56.0
	November 9.					
0	14 3 45	253	−12 53.8	160	15.3	56.0
2	14 7 58	253	13 9.8	157	15.3	55.9
4	14 12 11	254	13 25.5	154	15.3	55.9
6	14 16 25	253	13 40.9	152	15.2	55.9
8	14 20 38	254	13 56.1	149	15.2	55.8
10	14 24 52	254	14 11.0	145	15.2	55.8
12	14 29 6	254	14 25.5	143	15.2	55.7
14	14 33 20	254	14 39.8	139	15.2	55.7
16	14 37 34	255	14 53.7	137	15.2	55.7
18	14 41 49	255	15 7.4	133	15.2	55.6
20	14 46 4	255	15 20.7	130	15.2	55.6
22	14 50 19	255	15 33.7	127	15.2	55.5
	November 10.					
0	14 54 34	255	−15 46.4	124	15.2	55.5
2	14 58 49	255	15 58.8	120	15.1	55.5
4	15 3 4	256	16 10.8	117	15.1	55.4
6	15 7 20	256	16 22.5	114	15.1	55.4
8	15 11 36	256	16 33.9	110	15.1	55.4
10	15 15 52	256	16 44.9	107	15.1	55.3
12	15 20 8	256	16 55.6	103	15.1	55.3
14	15 24 24	256	17 5.9	100	15.1	55.2
16	15 28 40	257	17 15.9	96	15.1	55.2
18	15 32 57	256	17 25.5	93	15.1	55.2
20	15 37 13	257	17 34.8	89	15.0	55.1
22	15 41 30	257	17 43.7	86	15.0	55.1
	November 11.					
0	15 45 47	256	−17 52.3	82	15.0	55.1
2	15 50 3	257	18 0.5	78	15.0	55.0
4	15 54 20	257	18 8.3	75	15.0	55.0
6	15 58 37	257	18 15.8	71	15.0	55.0
8	16 2 54	257	18 22.9	68	15.0	54.9
10	16 7 11	257	18 29.7	63	15.0	54.9
12	16 11 28	257	18 36.0	60	15.0	54.9
14	16 15 45	256	18 42.0	57	15.0	54.8
16	16 20 1	257	18 47.7	52	15.0	54.8
18	16 24 18	257	18 52.9	49	15.0	54.8
20	16 28 35	257	18 57.8	45	14.9	54.7
22	16 32 52	256	19 2.3	42	14.9	54.7
24	16 37 8		−19 6.5		14.9	54.7

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	November 12.					
h	h m s		° ′		′	″
0	16 37 8	257	−19 6.5	37	14.9	54.7
2	16 41 25	256	19 10.2	34	14.9	54.7
4	16 45 41	256	19 13.6	31	14.9	54.6
6	16 49 57	256	19 16.7	26	14.9	54.6
8	16 54 13	256	19 19.3	23	14.9	54.6
10	16 58 29	256	19 21.6	19	14.9	54.5
12	17 2 45	256	19 23.5	15	14.9	54.5
14	17 7 1	255	19 25.0	11	14.9	54.5
16	17 11 16	255	19 26.1	8	14.9	54.5
18	17 15 31	255	19 26.9	4	14.9	54.4
20	17 19 46	255	19 27.3	0	14.9	54.4
22	17 24 1	254	19 27.3	3	14.8	54.4
	November 13.					
0	17 28 15	254	−19 27.0	7	14.8	54.4
2	17 32 29	254	19 26.3	11	14.8	54.4
4	17 36 43	254	19 25.2	14	14.8	54.3
6	17 40 57	253	19 23.8	18	14.8	54.3
8	17 45 10	253	19 22.0	22	14.8	54.3
10	17 49 23	252	19 19.8	25	14.8	54.3
12	17 53 35	252	19 17.3	29	14.8	54.3
14	17 57 47	252	19 14.4	32	14.8	54.2
16	18 1 59	252	19 11.2	36	14.8	54.2
18	18 6 11	251	19 7.6	39	14.8	54.2
20	18 10 22	251	19 3.7	43	14.8	54.2
22	18 14 33	250	18 59.4	47	14.8	54.2
	November 14.					
0	18 18 43	250	−18 54.7	50	14.8	54.2
2	18 22 53	249	18 49.7	53	14.8	54.2
4	18 27 2	249	18 44.4	57	14.8	54.1
6	18 31 11	249	18 38.7	60	14.8	54.1
8	18 35 20	248	18 32.7	63	14.8	54.1
10	18 39 28	248	18 26.4	67	14.8	54.1
12	18 43 36	248	18 19.7	70	14.8	54.1
14	18 47 44	247	18 12.7	73	14.8	54.1
16	18 51 51	246	18 5.4	77	14.8	54.1
18	18 55 57	246	17 57.7	79	14.8	54.1
20	19 0 3	246	17 49.8	83	14.8	54.1
22	19 4 9	245	17 41.5	86	14.8	54.1
	November 15.					
0	19 8 14	245	−17 32.9	90	14.8	54.1
2	19 12 19	244	17 23.9	92	14.8	54.1
4	19 16 23	244	17 14.7	95	14.8	54.1
6	19 20 27	243	17 5.2	98	14.8	54.1
8	19 24 30	243	16 55.4	102	14.8	54.1
10	19 28 33	242	16 45.2	104	14.8	54.1
12	19 32 35	242	16 34.8	107	14.8	54.1
14	19 36 37	242	16 24.1	110	14.8	54.1
16	19 40 39	241	16 13.1	113	14.8	54.1
18	19 44 40	241	16 1.8	116	14.8	54.1
20	19 48 41	240	15 50.2	118	14.8	54.1
22	19 52 41	240	15 38.4	121	14.8	54.1
24	19 56 41		−15 26.3		14.8	54.1

New Moon, Nov. 10d 4h 5m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	November 16.					
h	h m s		° ′		′	″
0	19 56 41	240	−15 26.3	124	14.8	54.1
2	20 0 41	239	15 13.9	127	14.8	54.1
4	20 4 40	238	15 1.2	129	14.8	54.2
6	20 8 38	239	14 48.3	132	14.8	54.2
8	20 12 37	238	14 35.1	135	14.8	54.2
10	20 16 35	237	14 21.6	137	14.8	54.2
12	20 20 32	238	14 7.9	139	14.8	54.2
14	20 24 30	237	13 54.0	142	14.8	54.2
16	20 28 27	236	13 39.8	145	14.8	54.3
18	20 32 23	237	13 25.3	146	14.8	54.3
20	20 36 20	236	13 10.7	149	14.8	54.3
22	20 40 16	235	12 55.8	152	14.8	54.3
	November 17.					
0	20 44 11	236	−12 40.6	154	14.8	54.4
2	20 48 7	235	12 25.2	156	14.8	54.4
4	20 52 2	235	12 9.6	158	14.9	54.4
6	20 55 57	235	11 53.8	160	14.9	54.4
8	20 59 52	234	11 37.8	163	14.9	54.5
10	21 3 46	235	11 21.5	165	14.9	54.5
12	21 7 41	234	11 5.0	166	14.9	54.5
14	21 11 35	234	10 48.4	169	14.9	54.6
16	21 15 29	234	10 31.5	171	14.9	54.6
18	21 19 23	234	10 14.4	173	14.9	54.6
20	21 23 17	233	9 57.1	174	14.9	54.7
22	21 27 10	234	9 39.7	177	14.9	54.7
	November 18.					
0	21 31 4	233	− 9 22.0	178	14.9	54.8
2	21 34 57	234	9 4.2	181	15.0	54.8
4	21 38 51	233	8 46.1	181	15.0	54.8
6	21 42 44	234	8 28.0	184	15.0	54.9
8	21 46 38	233	8 9.6	186	15.0	54.9
10	21 50 31	234	7 51.0	187	15.0	55.0
12	21 54 25	233	7 32.3	188	15.0	55.0
14	21 58 18	234	7 13.5	191	15.0	55.1
16	22 2 12	234	6 54.4	191	15.0	55.1
18	22 6 6	234	6 35.3	194	15.1	55.2
20	22 10 0	234	6 15.9	194	15.1	55.2
22	22 13 54	234	5 56.5	196	15.1	55.3
	November 19.					
0	22 17 48	234	− 5 36.9	198	15.1	55.3
2	22 21 42	235	5 17.1	199	15.1	55.4
4	22 25 37	235	4 57.2	200	15.1	55.4
6	22 29 32	235	4 37.2	201	15.1	55.5
8	22 33 27	236	4 17.1	202	15.2	55.5
10	22 37 23	235	3 56.9	204	15.2	55.6
12	22 41 18	237	3 36.5	205	15.2	55.7
14	22 45 15	236	3 16.0	205	15.2	55.7
16	22 49 11	237	2 55.5	207	15.2	55.8
18	22 53 8	237	2 34.8	208	15.2	55.8
20	22 57 5	238	2 14.0	209	15.3	55.9
22	23 1 3	238	1 53.1	209	15.3	56.0
24	23 5 1		− 1 32.2		15.3	56.0

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	November 20.					
h	h m s		° ′		′	″
0	23 5 1	239	− 1 32.2	210	15.3	56.0
2	23 9 0	240	1 11.2	211	15.3	56.1
4	23 13 0	239	0 50.1	212	15.3	56.2
6	23 16 59	241	0 28.9	212	15.3	56.2
8	23 21 0	241	− 0 7.7	213	15.4	56.3
10	23 25 1	242	+ 0 13.6	213	15.4	56.4
12	23 29 3	242	0 34.9	214	15.4	56.4
14	23 33 5	243	0 56.3	214	15.4	56.5
16	23 37 8	244	1 17.7	215	15.4	56.6
18	23 41 12	244	1 39.2	215	15.5	56.7
20	23 45 16	246	2 0.7	215	15.5	56.7
22	23 49 22	246	2 22.2	215	15.5	56.8
	November 21.					
0	23 53 28	247	+ 2 43.7	215	15.5	56.9
2	23 57 35	247	3 5.2	215	15.5	56.9
4	0 1 42	249	3 26.7	215	15.6	57.0
6	0 5 51	249	3 48.2	215	15.6	57.1
8	0 10 0	251	4 9.7	215	15.6	57.2
10	0 14 11	251	4 31.2	214	15.6	57.2
12	0 18 22	253	4 52.6	215	15.6	57.3
14	0 22 35	253	5 14.1	213	15.7	57.4
16	0 26 48	254	5 35.4	213	15.7	57.5
18	0 31 2	256	5 56.7	213	15.7	57.6
20	0 35 18	256	6 18.0	212	15.7	57.6
22	0 39 34	258	6 39.2	211	15.8	57.7
	November 22.					
0	0 43 52	259	+ 7 0.3	210	15.8	57.8
2	0 48 11	260	7 21.3	209	15.8	57.9
4	0 52 31	261	7 42.2	208	15.8	57.9
6	0 56 52	262	8 3.0	208	15.8	58.0
8	1 1 14	263	8 23.8	205	15.9	58.1
10	1 5 37	265	8 44.3	205	15.9	58.2
12	1 10 2	266	9 4.8	203	15.9	58.2
14	1 14 28	267	9 25.1	202	15.9	58.3
16	1 18 55	269	9 45.3	200	15.9	58.4
18	1 23 24	269	10 5.3	198	16.0	58.5
20	1 27 53	272	10 25.1	196	16.0	58.6
22	1 32 25	272	10 44.7	195	16.0	58.6
	November 23.					
0	1 36 57	274	+11 4.2	192	16.0	58.7
2	1 41 31	275	11 23.4	191	16.0	58.8
4	1 46 6	276	11 42.5	188	16.1	58.9
6	1 50 42	278	12 1.3	186	16.1	58.9
8	1 55 20	279	12 19.9	183	16.1	59.0
10	1 59 59	281	12 38.2	181	16.1	59.1
12	2 4 40	282	12 56.3	178	16.1	59.1
14	2 9 22	283	13 14.1	175	16.2	59.2
16	2 14 5	285	13 31.6	172	16.2	59.3
18	2 18 50	286	13 48.8	170	16.2	59.3
20	2 23 36	287	14 5.8	166	16.2	59.4
22	2 28 23	289	14 22.4	163	16.2	59.5
24	2 33 12		+14 38.7		16.3	59.5

First Quarter, Nov. 18d 8h 13m.

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	November 24.					
h	h m s		° ′	′	′	′
0	2 33 12	290	+14 38.7	159	16.3	59.5
2	2 38 2	292	14 54.6	157	16.3	59.6
4	2 42 54	292	15 10.3	152	16.3	59.7
6	2 47 46	295	15 25.5	149	16.3	59.7
8	2 52 41	295	15 40.4	145	16.3	59.8
10	2 57 36	297	15 54.9	141	16.3	59.9
12	3 2 33	298	16 9.0	138	16.4	59.9
14	3 7 31	300	16 22.8	133	16.4	60.0
16	3 12 31	300	16 36.1	128	16.4	60.0
18	3 17 31	302	16 48.9	125	16.4	60.1
20	3 22 33	303	17 1.4	120	16.4	60.1
22	3 27 36	304	17 13.4	116	16.4	60.2
	November 25.					
0	3 32 40	306	+17 25.0	110	16.4	60.2
2	3 37 46	306	17 36.0	107	16.4	60.3
4	3 42 52	308	17 46.7	101	16.5	60.3
6	3 48 0	308	17 56.8	96	16.5	60.4
8	3 53 8	310	18 6.4	92	16.5	60.4
10	3 58 18	310	18 15.6	86	16.5	60.4
12	4 3 28	311	18 24.2	82	16.5	60.5
14	4 8 39	312	18 32.4	76	16.5	60.5
16	4 13 51	313	18 40.0	70	16.5	60.5
18	4 19 4	314	18 47.0	66	16.5	60.6
20	4 24 18	314	18 53.6	60	16.5	60.6
22	4 29 32	315	18 59.6	54	16.6	60.6
	November 26.					
0	4 34 47	316	+19 5.0	49	16.6	60.7
2	4 40 3	316	19 9.9	43	16.6	60.7
4	4 45 19	317	19 14.2	38	16.6	60.7
6	4 50 36	317	19 18.0	32	16.6	60.7
8	4 55 53	317	19 21.2	27	16.6	60.8
10	5 1 10	318	19 23.9	20	16.6	60.8
12	5 6 28	318	19 25.9	15	16.6	60.8
14	5 11 46	318	19 27.4	9	16.6	60.8
16	5 17 4	318	19 28.3	4	16.6	60.8
18	5 22 22	318	19 28.7	— 3	16.6	60.8
20	5 27 40	319	19 28.4	8	16.6	60.8
22	5 32 59	318	19 27.6	14	16.6	60.8
	November 27.					
0	5 38 17	318	+19 26.2	20	16.6	60.8
2	5 43 35	318	19 24.2	25	16.6	60.8
4	5 48 53	318	19 21.7	31	16.6	60.8
6	5 54 11	317	19 18.6	37	16.6	60.8
8	5 59 28	317	19 14.9	43	16.6	60.8
10	6 4 45	317	19 10.6	48	16.6	60.8
12	6 10 2	316	19 5.8	54	16.6	60.8
14	6 15 18	316	19 0.4	59	16.6	60.8
16	6 20 34	315	18 54.5	65	16.6	60.8
18	6 25 49	314	18 48.0	71	16.6	60.8
20	6 31 3	314	18 40.9	75	16.6	60.8
22	6 36 17	313	18 33.4	81	16.6	60.7
24	6 41 30		+18 25.3		16.6	60.7

G.M.T.	Right Ascension.		Declination.		S. D.	H. P.
	November 28.					
h	h m s		° ′	′	′	′
0	6 41 30	312	+18 25.3	87	16.6	60.7
2	6 46 42	312	18 16.6	91	16.6	60.7
4	6 51 54	311	18 7.5	97	16.6	60.7
6	6 57 5	309	17 57.8	101	16.6	60.7
8	7 2 14	309	17 47.7	107	16.5	60.6
10	7 7 23	308	17 37.0	111	16.5	60.6
12	7 12 31	307	17 25.9	116	16.5	60.6
14	7 17 38	306	17 14.3	121	16.5	60.5
16	7 22 44	305	17 2.2	126	16.5	60.5
18	7 27 49	303	16 49.6	129	16.5	60.5
20	7 32 52	303	16 36.7	135	16.5	60.4
22	7 37 55	301	16 23.2	138	16.5	60.4
	November 29.					
0	7 42 56	301	+16 9.4	143	16.5	60.4
2	7 47 57	299	15 55.1	147	16.5	60.3
4	7 52 56	298	15 40.4	151	16.5	60.3
6	7 57 54	297	15 25.3	155	16.4	60.2
8	8 2 51	295	15 9.8	158	16.4	60.2
10	8 7 46	294	14 54.0	162	16.4	60.1
12	8 12 40	294	14 37.8	166	16.4	60.1
14	8 17 34	291	14 21.2	169	16.4	60.1
16	8 22 25	291	14 4.3	172	16.4	60.0
18	8 27 16	290	13 47.1	176	16.4	60.0
20	8 32 6	288	13 29.5	179	16.3	59.9
22	8 36 54	287	13 11.6	182	16.3	59.9
	November 30.					
0	8 41 41	285	+12 53.4	184	16.3	59.8
2	8 46 26	285	12 35.0	188	16.3	59.8
4	8 51 11	283	12 16.2	190	16.3	59.7
6	8 55 54	282	11 57.2	193	16.3	59.6
8	9 0 36	281	11 37.9	195	16.3	59.6
10	9 5 17	279	11 18.4	197	16.2	59.5
12	9 9 56	279	10 58.7	200	16.2	59.5
14	9 14 35	277	10 38.7	202	16.2	59.4
16	9 19 12	276	10 18.5	204	16.2	59.4
18	9 23 48	275	9 58.1	206	16.2	59.3
20	9 28 23	274	9 37.5	207	16.2	59.2
22	9 32 57	273	9 16.8	210	16.2	59.2
	December 1.					
0	9 37 30	271	+ 8 55.8	211	16.1	59.1
2	9 42 1	271	8 34.7	212	16.1	59.1
4	9 46 32	269	8 13.5	214	16.1	59.0
6	9 51 1	269	7 52.1	216	16.1	58.9
8	9 55 30	267	7 30.5	216	16.1	58.9
10	9 59 57	267	7 8.9	218	16.1	58.8
12	10 4 24	265	6 47.1	219	16.0	58.8
14	10 8 49	265	6 25.2	219	16.0	58.7
16	10 13 14	263	6 3.3	221	16.0	58.6
18	10 17 37	263	5 41.2	221	16.0	58.6
20	10 22 0	262	5 19.1	222	16.0	58.5
22	10 26 22	261	4 56.9	223	16.0	58.5
24	10 30 43		+ 4 34.6		15.9	58.4

Full Moon, Nov. 25d 13h 42m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.	G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	December 2.							December 6.					
h	h m s		° ′		′	″	h	h m s		° ′		′	″
0	10 30 43	260	+ 4 34.6	223	15.9	58.4	0	13 51 8	249	−12 1.0	167	15.2	55.8
2	10 35 3	260	4 12.3	224	15.9	58.3	2	13 55 17	249	12 17.7	164	15.2	55.8
4	10 39 23	259	3 49.9	224	15.9	58.3	4	13 59 26	249	12 34.1	162	15.2	55.8
6	10 43 42	257	3 27.5	224	15.9	58.2	6	14 3 35	249	12 50.3	159	15.2	55.7
8	10 47 59	258	3 5.1	224	15.9	58.2	8	14 7 44	250	13 6.2	156	15.2	55.7
10	10 52 17	256	2 42.7	225	15.9	58.1	10	14 11 54	249	13 21.8	154	15.2	55.6
12	10 56 33	256	2 20.2	224	15.8	58.0	12	14 16 3	250	13 37.2	150	15.2	55.6
14	11 0 49	255	1 57.8	224	15.8	58.0	14	14 20 13	251	13 52.2	148	15.2	55.5
16	11 5 4	255	1 35.4	225	15.8	57.9	16	14 24 24	250	14 7.0	145	15.2	55.5
18	11 9 19	254	1 12.9	224	15.8	57.9	18	14 28 34	251	14 21.5	142	15.1	55.5
20	11 13 33	253	0 50.5	224	15.8	57.8	20	14 32 45	250	14 35.7	140	15.1	55.4
22	11 17 46	253	0 28.1	223	15.8	57.7	22	14 36 55	252	14 49.7	136	15.1	55.4
	December 3.							December 7.					
0	11 21 59	253	+ 0 5.8	223	15.7	57.7	0	14 41 7	251	−15 3.3	133	15.1	55.4
2	11 26 12	252	− 0 16.5	223	15.7	57.6	2	14 45 18	251	15 16.6	130	15.1	55.3
4	11 30 24	251	0 38.8	222	15.7	57.6	4	14 49 29	252	15 29.6	127	15.1	55.3
6	11 34 35	251	1 1.0	221	15.7	57.5	6	14 53 41	252	15 42.3	124	15.1	55.2
8	11 38 46	251	1 23.1	221	15.7	57.5	8	14 57 53	252	15 54.7	121	15.1	55.2
10	11 42 57	250	1 45.2	220	15.7	57.4	10	15 2 5	253	16 6.8	117	15.1	55.2
12	11 47 7	250	2 7.2	219	15.6	57.3	12	15 6 18	253	16 18.5	115	15.0	55.1
14	11 51 17	250	2 29.1	218	15.6	57.3	14	15 10 31	252	16 30.0	110	15.0	55.1
16	11 55 27	249	2 50.9	217	15.6	57.2	16	15 14 43	254	16 41.0	108	15.0	55.1
18	11 59 36	249	3 12.6	216	15.6	57.2	18	15 18 57	253	16 51.8	105	15.0	55.0
20	12 3 45	249	3 34.2	216	15.6	57.1	20	15 23 10	253	17 2.3	101	15.0	55.0
22	12 7 54	249	3 55.8	214	15.6	57.1	22	15 27 23	254	17 12.4	97	15.0	55.0
	December 4.							December 8.					
0	12 12 3	248	− 4 17.2	212	15.6	57.0	0	15 31 37	254	−17 22.1	94	15.0	54.9
2	12 16 11	248	4 38.4	212	15.5	57.0	2	15 35 51	254	17 31.5	91	15.0	54.9
4	12 20 19	248	4 59.6	210	15.5	56.9	4	15 40 5	254	17 40.6	87	15.0	54.9
6	12 24 27	248	5 20.6	209	15.5	56.8	6	15 44 19	255	17 49.3	84	15.0	54.8
8	12 28 35	247	5 41.5	207	15.5	56.8	8	15 48 34	254	17 57.7	80	15.0	54.8
10	12 32 42	248	6 2.2	206	15.5	56.7	10	15 52 48	255	18 5.7	77	15.0	54.8
12	12 36 50	247	6 22.8	204	15.5	56.7	12	15 57 3	254	18 13.4	73	14.9	54.8
14	12 40 57	248	6 43.2	202	15.5	56.6	14	16 1 17	255	18 20.7	69	14.9	54.7
16	12 45 5	247	7 3.4	201	15.4	56.6	16	16 5 32	255	18 27.6	66	14.9	54.7
18	12 49 12	248	7 23.5	199	15.4	56.5	18	16 9 47	255	18 34.2	63	14.9	54.7
20	12 53 20	247	7 43.4	198	15.4	56.5	20	16 14 2	255	18 40.5	58	14.9	54.6
22	12 57 27	247	8 3.2	195	15.4	56.4	22	16 18 17	256	18 46.3	55	14.9	54.6
	December 5.							December 9.					
0	13 1 34	248	− 8 22.7	194	15.4	56.4	0	16 22 33	255	−18 51.8	52	14.9	54.6
2	13 5 42	247	8 42.1	192	15.4	56.3	2	16 26 48	255	18 57.0	48	14.9	54.6
4	13 9 49	247	9 1.3	189	15.4	56.3	4	16 31 3	255	19 1.8	44	14.9	54.5
6	13 13 56	248	9 20.2	188	15.3	56.2	6	16 35 18	255	19 6.2	40	14.9	54.5
8	13 18 4	247	9 39.0	185	15.3	56.2	8	16 39 33	256	19 10.2	37	14.9	54.5
10	13 22 11	248	9 57.5	184	15.3	56.1	10	16 43 49	255	19 13.9	33	14.9	54.5
12	13 26 19	248	10 15.9	181	15.3	56.1	12	16 48 4	255	19 17.2	29	14.9	54.4
14	13 30 27	248	10 34.0	179	15.3	56.1	14	16 52 19	255	19 20.1	25	14.9	54.4
16	13 34 35	248	10 51.9	176	15.3	56.0	16	16 56 34	255	19 22.6	22	14.9	54.4
18	13 38 43	248	11 9.5	174	15.3	56.0	18	17 0 49	255	19 24.8	18	14.8	54.4
20	13 42 51	249	11 26.9	172	15.3	55.9	20	17 5 4	255	19 26.6	15	14.8	54.4
22	13 47 0	248	11 44.1	169	15.3	55.9	22	17 9 19	254	19 28.1	11	14.8	54.3
24	13 51 8		−12 1.0		15.2	55.8	24	17 13 33		−19 29.2		14.8	54.3

Last Quarter, Dec. 2d 4h 29m.
New Moon, Dec. 9d 22h 4m.

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	December 10.					
h	h m s		° ′		′	′
0	17 13 33	255	−19 29.2	7	14.8	54.3
2	17 17 48	254	19 29.9	8	14.8	54.3
4	17 22 2	254	19 30.2	9	14.8	54.3
6	17 26 16	254	19 30.2	4	14.8	54.3
8	17 30 30	254	19 29.8	8	14.8	54.2
10	17 34 44	253	19 29.0	11	14.8	54.2
12	17 38 57	254	19 27.9	15	14.8	54.2
14	17 43 11	253	19 26.4	19	14.8	54.2
16	17 47 24	252	19 24.5	22	14.8	54.2
18	17 51 36	253	19 22.3	26	14.8	54.1
20	17 55 49	252	19 19.7	30	14.8	54.1
22	18 0 1	252	19 16.7	33	14.8	54.1
	December 11.					
0	18 4 13	251	−19 13.4	36	14.8	54.1
2	18 8 24	252	19 9.8	40	14.8	54.1
4	18 12 36	250	19 5.8	44	14.8	54.1
6	18 16 46	251	19 1.4	47	14.8	54.1
8	18 20 57	250	18 56.7	50	14.8	54.1
10	18 25 7	250	18 51.7	54	14.8	54.0
12	18 29 17	249	18 46.3	58	14.7	54.0
14	18 33 26	249	18 40.5	60	14.7	54.0
16	18 37 35	249	18 34.5	64	14.7	54.0
18	18 41 44	248	18 28.1	68	14.7	54.0
20	18 45 52	247	18 21.3	70	14.7	54.0
22	18 49 59	247	18 14.3	74	14.7	54.0
	December 12.					
0	18 54 6	247	−18 6.9	78	14.7	54.0
2	18 58 13	247	17 59.1	80	14.7	54.0
4	19 2 20	245	17 51.1	84	14.7	54.0
6	19 6 25	246	17 42.7	86	14.7	54.0
8	19 10 31	245	17 34.1	90	14.7	54.0
10	19 14 36	244	17 25.1	93	14.7	54.0
12	19 18 40	244	17 15.8	96	14.7	54.0
14	19 22 44	244	17 6.2	99	14.7	54.0
16	19 26 48	243	16 56.3	102	14.7	54.0
18	19 30 51	242	16 46.1	105	14.7	54.0
20	19 34 53	242	16 35.6	108	14.7	54.0
22	19 38 55	242	16 24.8	110	14.7	54.0
	December 13.					
0	19 42 57	241	−16 13.8	114	14.7	54.0
2	19 46 58	241	16 2.4	116	14.7	54.0
4	19 50 59	240	15 50.8	119	14.7	54.0
6	19 54 59	239	15 38.9	121	14.7	54.0
8	19 58 58	240	15 26.8	125	14.7	54.0
10	20 2 58	238	15 14.3	127	14.7	54.0
12	20 6 56	239	15 1.6	129	14.7	54.0
14	20 10 55	238	14 48.7	132	14.7	54.0
16	20 14 53	237	14 35.5	135	14.7	54.0
18	20 18 50	237	14 22.0	137	14.7	54.0
20	20 22 47	237	14 8.3	140	14.7	54.0
22	20 26 44	236	13 54.3	142	14.7	54.0
24	20 30 40		−13 40.1		14.8	54.0

G. M. T.	Right Ascension.		Declination.		S. D.	H. P.
	December 14.					
h	h m s		° ′		′	′
0	20 30 40	236	−13 40.1	144	14.8	54.0
2	20 34 36	235	13 25.7	146	14.8	54.1
4	20 38 31	235	13 11.1	149	14.8	54.1
6	20 42 26	235	12 56.2	151	14.8	54.1
8	20 46 21	234	12 41.1	154	14.8	54.1
10	20 50 15	234	12 25.7	155	14.8	54.1
12	20 54 9	233	12 10.2	158	14.8	54.1
14	20 58 2	233	11 54.4	159	14.8	54.2
16	21 1 55	233	11 38.5	162	14.8	54.2
18	21 5 48	233	11 22.3	164	14.8	54.2
20	21 9 41	232	11 5.9	165	14.8	54.2
22	21 13 33	232	10 49.4	168	14.8	54.3
	December 15.					
0	21 17 25	232	−10 32.6	169	14.8	54.3
2	21 21 17	231	10 15.7	172	14.8	54.3
4	21 25 8	232	9 58.5	173	14.8	54.3
6	21 29 0	231	9 41.2	174	14.8	54.4
8	21 32 51	231	9 23.8	177	14.8	54.4
10	21 36 42	231	9 6.1	178	14.9	54.4
12	21 40 33	230	8 48.3	180	14.9	54.4
14	21 44 23	231	8 30.3	181	14.9	54.5
16	21 48 14	230	8 12.2	183	14.9	54.5
18	21 52 4	230	7 53.9	185	14.9	54.5
20	21 55 54	231	7 35.4	186	14.9	54.6
22	21 59 45	230	7 16.8	187	14.9	54.6
	December 16.					
0	22 3 35	230	− 6 58.1	189	14.9	54.6
2	22 7 25	230	6 39.2	190	14.9	54.7
4	22 11 15	230	6 20.2	191	14.9	54.7
6	22 15 5	231	6 1.1	193	14.9	54.8
8	22 18 56	230	5 41.8	194	15.0	54.8
10	22 22 46	230	5 22.4	195	15.0	54.8
12	22 26 36	231	5 2.9	196	15.0	54.9
14	22 30 27	230	4 43.3	197	15.0	54.9
16	22 34 17	231	4 23.6	199	15.0	55.0
18	22 38 8	231	4 3.7	199	15.0	55.0
20	22 41 59	231	3 43.8	200	15.0	55.1
22	22 45 50	232	3 23.8	201	15.0	55.1
	December 17.					
0	22 49 42	231	− 3 3.7	202	15.1	55.2
2	22 53 33	232	2 43.5	203	15.1	55.2
4	22 57 25	233	2 23.2	204	15.1	55.3
6	23 1 18	232	2 2.8	204	15.1	55.3
8	23 5 10	233	1 42.4	205	15.1	55.4
10	23 9 3	234	1 21.9	206	15.1	55.4
12	23 12 57	233	1 1.3	206	15.1	55.5
14	23 16 50	235	0 40.7	207	15.2	55.6
16	23 20 45	234	− 0 20.0	208	15.2	55.6
18	23 24 39	236	+ 0 0.8	207	15.2	55.7
20	23 28 35	235	0 21.5	209	15.2	55.7
22	23 32 30	237	0 42.4	208	15.2	55.8
24	23 36 27		+ 1 3.2		15.2	55.8

G.M.T.	Right Ascension.	Declination.	S.D.	H.P.
December 18.				
h	h m s	° ′	′	″
0	23 36 27	+ 1 3.2	15.2	55.8
2	23 40 24	1 24.1	15.3	55.9
4	23 44 21	1 45.0	15.3	56.0
6	23 48 19	2 5.9	15.3	56.0
8	23 52 18	2 26.8	15.3	56.1
10	23 56 17	2 47.8	15.3	56.2
12	0 0 18	3 8.7	15.4	56.2
14	0 4 19	3 29.6	15.4	56.3
16	0 8 20	3 50.5	15.4	56.4
18	0 12 23	4 11.4	15.4	56.5
20	0 16 26	4 32.3	15.4	56.5
22	0 20 31	4 53.1	15.5	56.6
December 19.				
0	0 24 36	+ 5 14.0	15.5	56.7
2	0 28 42	5 34.7	15.5	56.7
4	0 32 49	5 55.4	15.5	56.8
6	0 36 57	6 16.1	15.5	56.9
8	0 41 6	6 36.7	15.6	57.0
10	0 45 16	6 57.2	15.6	57.0
12	0 49 27	7 17.6	15.6	57.1
14	0 53 40	7 38.0	15.6	57.2
16	0 57 53	7 58.2	15.6	57.3
18	1 2 7	8 18.4	15.7	57.4
20	1 6 23	8 38.4	15.7	57.4
22	1 10 40	8 58.3	15.7	57.5
December 20.				
0	1 14 58	+ 9 18.1	15.7	57.6
2	1 19 17	9 37.8	15.7	57.7
4	1 23 38	9 57.3	15.8	57.8
6	1 28 0	10 16.6	15.8	57.8
8	1 32 23	10 35.8	15.8	57.9
10	1 36 47	10 54.9	15.8	58.0
12	1 41 13	11 13.7	15.9	58.1
14	1 45 40	11 32.4	15.9	58.2
16	1 50 9	11 50.8	15.9	58.3
18	1 54 39	12 9.1	15.9	58.3
20	1 59 10	12 27.1	15.9	58.4
22	2 3 43	12 44.9	16.0	58.5
December 21.				
0	2 8 18	+13 2.4	16.0	58.6
2	2 12 53	13 19.8	16.0	58.7
4	2 17 31	13 36.8	16.0	58.7
6	2 22 9	13 53.6	16.1	58.8
8	2 26 50	14 10.1	16.1	58.9
10	2 31 31	14 26.3	16.1	59.0
12	2 36 14	14 42.2	16.1	59.1
14	2 40 59	14 57.8	16.1	59.2
16	2 45 45	15 13.0	16.2	59.2
18	2 50 33	15 28.0	16.2	59.3
20	2 55 22	15 42.5	16.2	59.4
22	3 0 13	15 56.8	16.2	59.5
24	3 5 5	+16 10.6	16.3	59.6

G.M.T.	Right Ascension.	Declination.	S.D.	H.P.
December 22.				
h	h m s	° ′	′	″
0	3 5 5	+16 10.6	16.3	59.6
2	3 9 59	16 24.1	16.3	59.6
4	3 14 54	16 37.2	16.3	59.7
6	3 19 51	16 49.9	16.3	59.8
8	3 24 49	17 2.2	16.3	59.8
10	3 29 48	17 14.0	16.4	59.9
12	3 34 49	17 25.4	16.4	60.0
14	3 39 51	17 36.4	16.4	60.1
16	3 44 55	17 46.9	16.4	60.1
18	3 50 0	17 57.0	16.4	60.2
20	3 55 6	18 6.6	16.4	60.3
22	4 0 13	18 15.7	16.5	60.3
December 23.				
0	4 5 22	+18 24.3	16.5	60.4
2	4 10 32	18 32.4	16.5	60.5
4	4 15 43	18 40.0	16.5	60.5
6	4 20 55	18 47.1	16.5	60.6
8	4 26 8	18 53.7	16.5	60.6
10	4 31 22	18 59.7	16.6	60.7
12	4 36 37	19 5.2	16.6	60.8
14	4 41 53	19 10.2	16.6	60.8
16	4 47 10	19 14.5	16.6	60.8
18	4 52 28	19 18.4	16.6	60.9
20	4 57 46	19 21.6	16.6	60.9
22	5 3 6	19 24.3	16.6	61.0
December 24.				
0	5 8 25	+19 26.4	16.7	61.0
2	5 13 46	19 27.9	16.7	61.1
4	5 19 7	19 28.9	16.7	61.1
6	5 24 28	19 29.2	16.7	61.1
8	5 29 50	19 29.0	16.7	61.2
10	5 35 12	19 28.2	16.7	61.2
12	5 40 34	19 26.8	16.7	61.3
14	5 45 57	19 24.7	16.7	61.3
16	5 51 20	19 22.1	16.7	61.3
18	5 56 42	19 18.9	16.7	61.3
20	6 2 5	19 15.2	16.7	61.3
22	6 7 28	19 10.8	16.7	61.4
December 25.				
0	6 12 51	+19 5.8	16.8	61.4
2	6 18 13	19 0.2	16.8	61.4
4	6 23 35	18 54.1	16.8	61.4
6	6 28 57	18 47.4	16.8	61.4
8	6 34 19	18 40.1	16.8	61.4
10	6 39 40	18 32.3	16.8	61.4
12	6 45 0	18 23.8	16.8	61.4
14	6 50 20	18 14.9	16.8	61.4
16	6 55 40	18 5.3	16.8	61.4
18	7 0 59	17 55.3	16.8	61.4
20	7 6 17	17 44.6	16.8	61.4
22	7 11 34	17 33.5	16.8	61.4
24	7 16 51	+17 21.9	16.8	61.4

First Quarter, Dec. 18d 2h 40m.
Full Moon, Dec. 25d 0h 38m.
Last Quarter, Dec. 31d 16h 35m.

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	December 26.					
h	h m s		° ′		′	′
0	7 16 51	315	+17 21.9	122	16.8	61.4
2	7 22 6	315	17 9.7	127	16.8	61.4
4	7 27 21	314	16 57.0	131	16.7	61.4
6	7 32 35	313	16 43.9	136	16.7	61.3
8	7 37 48	312	16 30.3	141	16.7	61.3
10	7 43 0	311	16 16.2	146	16.7	61.3
12	7 48 11	309	16 1.6	150	16.7	61.3
14	7 53 20	309	15 46.6	155	16.7	61.2
16	7 58 29	308	15 31.1	158	16.7	61.2
18	8 3 37	306	15 15.3	163	16.7	61.2
20	8 8 43	305	14 59.0	167	16.7	61.1
22	8 13 48	304	14 42.3	171	16.7	61.1
	December 27.					
0	8 18 52	303	+14 25.2	175	16.7	61.1
2	8 23 55	302	14 7.7	178	16.7	61.0
4	8 28 57	300	13 49.9	181	16.6	61.0
6	8 33 57	299	13 31.8	186	16.6	60.9
8	8 38 56	298	13 13.2	188	16.6	60.9
10	8 43 54	296	12 54.4	192	16.6	60.8
12	8 48 50	296	12 35.2	194	16.6	60.8
14	8 53 46	294	12 15.8	198	16.6	60.7
16	8 58 40	292	11 56.0	200	16.6	60.7
18	9 3 32	292	11 36.0	203	16.5	60.6
20	9 8 24	290	11 15.7	205	16.5	60.6
22	9 13 14	289	10 55.2	208	16.5	60.5
	December 28.					
0	9 18 3	287	+10 34.4	210	16.5	60.5
2	9 22 50	287	10 13.4	213	16.5	60.4
4	9 27 37	285	9 52.1	214	16.5	60.3
6	9 32 22	284	9 30.7	216	16.5	60.3
8	9 37 6	282	9 9.1	218	16.4	60.2
10	9 41 48	282	8 47.3	219	16.4	60.1
12	9 46 30	280	8 25.4	222	16.4	60.1
14	9 51 10	279	8 3.2	222	16.4	60.0
16	9 55 49	278	7 41.0	224	16.4	59.9
18	10 0 27	277	7 18.6	225	16.3	59.9
20	10 5 4	275	6 56.1	226	16.3	59.8
22	10 9 39	275	6 33.5	228	16.3	59.7
24	10 14 14		+ 6 10.7		16.3	59.7

G.M.T.	Right Ascension.		Declination.		S.D.	H.P.
	December 29.					
h	h m s		° ′		′	′
0	10 14 14	273	+6 10.7	228	16.3	59.7
2	10 18 47	273	5 47.9	228	16.3	59.6
4	10 23 20	271	5 25.1	230	16.2	59.5
6	10 27 51	270	5 2.1	230	16.2	59.4
8	10 32 21	269	4 39.1	230	16.2	59.4
10	10 36 50	269	4 16.1	231	16.2	59.3
12	10 41 19	267	3 53.0	231	16.2	59.2
14	10 45 46	266	3 29.9	231	16.1	59.1
16	10 50 12	266	3 6.8	232	16.1	59.1
18	10 54 38	264	2 43.6	231	16.1	59.0
20	10 59 2	264	2 20.5	231	16.1	58.9
22	11 3 26	263	1 57.4	231	16.1	58.8
	December 30.					
0	11 7 49	262	+1 34.3	231	16.0	58.8
2	11 12 11	261	1 11.2	230	16.0	58.7
4	11 16 32	261	0 48.2	230	16.0	58.6
6	11 20 53	260	0 25.2	229	16.0	58.5
8	11 25 13	259	+0 2.3	229	16.0	58.5
10	11 29 32	258	−0 20.6	228	15.9	58.4
12	11 33 50	258	0 43.4	227	15.9	58.3
14	11 38 8	257	1 6.1	226	15.9	58.2
16	11 42 25	257	1 28.7	226	15.9	58.2
18	11 46 42	256	1 51.3	224	15.9	58.1
20	11 50 58	255	2 13.7	223	15.8	58.0
22	11 55 13	255	2 36.0	223	15.8	57.9
	December 31.					
0	11 59 28	254	−2 58.3	221	15.8	57.8
2	12 3 42	254	3 20.4	219	15.8	57.8
4	12 7 56	254	3 42.3	219	15.7	57.7
6	12 12 10	253	4 4.2	217	15.7	57.6
8	12 16 23	252	4 25.9	216	15.7	57.6
10	12 20 35	253	4 47.5	214	15.7	57.5
12	12 24 48	251	5 8.9	212	15.7	57.4
14	12 28 59	252	5 30.1	211	15.6	57.3
16	12 33 11	251	5 51.2	209	15.6	57.3
18	12 37 22	251	6 12.1	208	15.6	57.2
20	12 41 33	251	6 32.9	205	15.6	57.1
22	12 45 44	250	6 53.4	204	15.6	57.1
24	12 49 54		−7 13.8		15.6	57.0

PHASES OF THE MOON.

		d	h	m		d	h	m		d	h	m		d	h	m
○	Full Moon	Jan. 5	9	5	Apr. 2	22	55		June 30	20	41		Sept. 27	13	57
☾	Last Quarter	12	12	9	11	1	24		July 8	17	6		Oct. 4	12	54
●	New Moon	20	17	27	18	9	43		15	8	25		11	12	50
☽	First Quarter	28	3	38	25	1	28		22	7	20		19	12	29
○	Full Moon	Feb. 3	20	42	May 2	13	47		30	11	19		27	2	9
☾	Last Quarter	11	8	49	10	17	51		Aug. 7	0	51		Nov. 2	19	35
●	New Moon	19	9	35	17	18	25		13	15	44		10	4	5
☽	First Quarter	26	11	50	24	9	7		20	22	52		18	8	13
○	Full Moon	Mar. 4	9	13	June 1	5	18		29	1	3		25	13	42
☾	Last Quarter	12	5	57	9	6	58		Sept. 5	7	5		Dec. 2	4	29
●	New Moon	19	22	56	16	1	41		12	0	52		9	22	4
☽	First Quarter	26	18	45	22	18	50		19	16	55		18	2	40
○	Full Moon	Apr. 2	22	55	30	20	41		27	13	57		25	0	38
☾	Last Quarter	11	1	24	July 8	17	6		Oct. 4	12	54		31	16	35

TIME OF TRANSIT, MERIDIAN OF GREENWICH.

Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.	
	h m			h m			h m			h m	
Jan. 1	8 5	59	Feb. 16	22 14	47	Apr. 1	10 51	47	May 18	0 12	62
2	9 4	62	17	23 1	47	2	11 38	46	19	1 14	63
3	10 6	63	18	23 48	48	3	12 24	47	20	2 17	61
4	11 9	62	20	0 36	47	4	13 11	47	21	3 18	57
5	12 11	59	21	1 23	49	5	13 58	48	22	4 15	54
6	13 10	55	22	2 12	50	6	14 46	48	23	5 9	50
7	14 5	51	23	3 2	52	7	15 34	48	24	5 59	48
8	14 56	49	24	3 54	55	8	16 22	48	25	6 47	46
9	15 45	46	25	4 49	57	9	17 10	47	26	7 33	46
10	16 31	45	26	5 46	58	10	17 57	47	27	8 19	45
11	17 16	45	27	6 44	59	11	18 44	46	28	9 4	46
12	18 1	45	28	7 43	58	12	19 30	47	29	9 50	47
13	18 46	46	29	8 41	56	13	20 17	47	30	10 37	47
14	19 32	47	Mar. 1	9 37	53	14	21 4	48	31	11 24	48
15	20 19	48	2	10 30	52	15	21 52	50	June 1	12 12	48
16	21 7	49	3	11 22	49	16	22 42	53	2	13 0	48
17	21 56	48	4	12 11	47	17	23 35	55	3	13 48	47
18	22 44	48	5	12 58	47	19	0 30	59	4	14 35	46
19	23 32	48	6	13 45	47	20	1 29	60	5	15 21	45
21	0 20	47	7	14 32	47	21	2 29	61	6	16 6	44
22	1 7	47	8	15 19	47	22	3 30	60	7	16 50	45
23	1 54	46	9	16 6	47	23	4 30	58	8	17 35	46
24	2 40	46	10	16 53	48	24	5 28	54	9	18 21	48
25	3 26	48	11	17 41	48	25	6 22	51	10	19 9	50
26	4 14	50	12	18 29	48	26	7 13	49	11	19 59	54
27	5 4	53	13	19 17	48	27	8 2	46	12	20 53	59
28	5 57	56	14	20 5	47	28	8 48	46	13	21 52	61
29	6 53	59	15	20 52	48	29	9 34	46	14	22 53	63
30	7 52	60	16	21 40	47	30	10 20	46	15	23 56	64
31	8 52	61	17	22 27	48	May 1	11 6	47	17	1 0	61
Feb. 1	9 53	59	18	23 15	49	2	11 53	47	18	2 1	57
2	10 52	57	20	0 4	51	3	12 40	48	19	2 58	54
3	11 49	53	21	0 55	53	4	13 28	48	20	3 52	50
4	12 42	51	22	1 48	55	5	14 16	48	21	4 42	48
5	13 33	48	23	2 43	58	6	15 4	48	22	5 30	47
6	14 21	47	24	3 41	59	7	15 52	46	23	6 17	45
7	15 8	46	25	4 40	59	8	16 38	46	24	7 2	46
8	15 54	46	26	5 39	57	9	17 24	46	25	7 48	47
9	16 40	46	27	6 36	56	10	18 10	45	26	8 35	47
10	17 26	47	28	7 32	53	11	18 55	46	27	9 22	47
11	18 13	48	29	8 25	50	12	19 41	48	28	10 9	48
12	19 1	48	30	9 15	49	13	20 29	51	29	10 57	48
13	19 49	48	31	10 4	47	14	21 20	53	30	11 45	47
14	20 37	49	Apr. 1	10 51	47	15	22 13	58	July 1	12 32	47
15	21 26	48	2	11 38	46	16	23 11	61	2	13 19	45
16	22 14		3	12 24		18	0 12		3	14 4	

TIME OF TRANSIT, MERIDIAN OF GREENWICH.

Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.		Date.	Greenwich Mean Time.	
	h m			h m			h m			h m	
July 1	12 32	47	Aug. 16	2 0	49	Oct. 1	15 13	57	Nov. 16	4 24	44
2	13 19	45	17	2 49	48	2	16 10	59	17	5 8	45
3	14 4	45	18	3 37	48	3	17 9	58	18	5 53	44
4	14 49	45	19	4 25	48	4	18 7	56	19	6 37	45
5	15 34	44	20	5 13	48	5	19 3	54	20	7 22	46
6	16 18	46	21	6 1	48	6	19 57	52	21	8 8	49
7	17 4	48	22	6 49	48	7	20 49	51	22	8 57	52
8	17 52	51	23	7 37	47	8	21 40	49	23	9 49	56
9	18 43	54	24	8 24	47	9	22 29	49	24	10 45	59
10	19 37	58	25	9 11	47	10	23 18	48	25	11 44	62
11	20 35	61	26	9 58	46	12	0 6	49	26	12 46	62
12	21 36	63	27	10 44	45	13	0 55	49	27	13 48	61
13	22 39	62	28	11 29	46	14	1 44	49	28	14 49	58
14	23 41	60	29	12 15	46	15	2 33	49	29	15 47	55
16	0 41	57	30	13 1	47	16	3 22	48	30	16 42	52
17	1 38	54	31	13 48	49	17	4 10	48	Dec. 1	17 34	49
18	2 32	50	Sept. 1	14 37	51	18	4 58	46	2	18 23	48
19	3 22	49	2	15 28	53	19	5 44	46	3	19 11	47
20	4 11	47	3	16 21	56	20	6 30	45	4	19 58	47
21	4 58	47	4	17 17	58	21	7 15	45	5	20 45	48
22	5 45	46	5	18 15	59	22	8 0	45	6	21 33	48
23	6 31	47	6	19 14	58	23	8 45	47	7	22 21	48
24	7 18	48	7	20 12	57	24	9 32	48	8	23 9	49
25	8 6	48	8	21 9	55	25	10 20	52	9	23 58	48
26	8 54	48	9	22 4	53	26	11 12	54	11	0 46	48
27	9 42	47	10	22 57	51	27	12 6	56	12	1 34	46
28	10 29	47	11	23 48	50	28	13 2	60	13	2 20	45
29	11 16	46	13	0 38	49	29	14 2	60	14	3 5	44
30	12 2	46	14	1 27	49	30	15 2	59	15	3 49	43
31	12 48	45	15	2 16	48	31	16 1	58	16	4 32	44
Aug. 1	13 33	45	16	3 4	49	Nov. 1	16 59	55	17	5 16	44
2	14 18	45	17	3 53	49	2	17 54	52	18	6 0	46
3	15 3	47	18	4 42	48	3	18 46	50	19	6 46	49
4	15 50	49	19	5 30	48	4	19 36	49	20	7 35	53
5	16 39	51	20	6 18	47	5	20 25	47	21	8 28	56
6	17 30	55	21	7 5	46	6	21 12	48	22	9 24	60
7	18 25	58	22	7 51	46	7	22 0	48	23	10 24	62
8	19 23	60	23	8 37	46	8	22 48	48	24	11 26	64
9	20 23	61	24	9 23	45	9	23 36	49	25	12 30	61
10	21 24	60	25	10 8	47	11	0 25	49	26	13 31	59
11	22 24	58	26	10 55	47	12	1 14	49	27	14 30	55
12	23 22	55	27	11 42	49	13	2 3	48	28	15 25	53
14	0 17	53	28	12 31	52	14	2 51	47	29	16 18	50
15	1 10	50	29	13 23	53	15	3 38	46	30	17 8	48
16	2 0	49	30	14 16	57	16	4 24	44	31	17 56	47
17	2 49		Oct. 1	15 13		17	5 8		32	18 43	

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Jan. 1	15 39 40	285	−16 57.2	171	21 1	Feb. 16	19 34 11	312	−21 10.7	87	21 55
2	15 44 25	286	17 14.3	166	21 2	17	19 39 23	311	21 2.0	93	21 56
3	15 49 11	288	17 30.9	163	21 3	18	19 44 34	311	20 52.7	100	21 57
4	15 53 59	289	17 47.2	159	21 4	19	19 49 45	310	20 42.7	106	21 58
5	15 58 48	291	18 3.1	156	21 4	20	19 54 55	310	20 32.1	111	22 0
6	16 3 39	291	−18 18.7	151	21 5	21	20 0 5	308	−20 21.0	118	22 1
7	16 8 30	293	18 33.8	146	21 6	22	20 5 13	309	20 9.2	123	22 2
8	16 13 23	295	18 48.4	143	21 7	23	20 10 22	307	19 56.9	130	22 3
9	16 18 18	295	19 2.7	138	21 8	24	20 15 29	306	19 43.9	135	22 4
10	16 23 13	297	19 16.5	133	21 9	25	20 20 35	306	19 30.4	140	22 5
11	16 28 10	298	−19 29.8	129	21 10	26	20 25 41	305	−19 16.4	147	22 6
12	16 33 8	299	19 42.7	123	21 11	27	20 30 46	304	19 1.7	151	22 8
13	16 38 7	300	19 55.0	119	21 12	28	20 35 50	303	18 46.6	158	22 9
14	16 43 7	302	20 6.9	114	21 13	29	20 40 53	302	18 30.8	162	22 10
15	16 48 9	302	20 18.3	109	21 14	Mar. 1	20 45 55	301	18 14.6	168	22 11
16	16 53 11	304	−20 29.2	103	21 16	2	20 50 56	300	−17 57.8	172	22 12
17	16 58 15	304	20 39.5	98	21 17	3	20 55 56	300	17 40.6	178	22 13
18	17 3 19	305	20 49.3	92	21 18	4	21 0 56	298	17 22.8	183	22 14
19	17 8 24	307	20 58.5	87	21 19	5	21 5 54	297	17 4.5	188	22 15
20	17 13 31	307	21 7.2	82	21 20	6	21 10 51	297	16 45.7	192	22 16
21	17 18 38	308	−21 15.4	75	21 21	7	21 15 48	295	−16 26.5	197	22 17
22	17 23 46	309	21 22.9	70	21 23	8	21 20 43	294	16 6.8	202	22 18
23	17 28 55	309	21 29.9	64	21 24	9	21 25 37	294	15 46.6	206	22 19
24	17 34 4	310	21 36.3	58	21 25	10	21 30 31	292	15 26.0	210	22 20
25	17 39 14	311	21 42.1	52	21 26	11	21 35 23	292	15 5.0	215	22 21
26	17 44 25	312	−21 47.3	45	21 28	12	21 40 15	290	−14 43.5	219	22 22
27	17 49 37	312	21 51.8	40	21 29	13	21 45 5	290	14 21.6	222	22 23
28	17 54 49	312	21 55.8	34	21 30	14	21 49 55	289	13 59.4	227	22 24
29	18 0 1	313	21 59.2	27	21 31	15	21 54 44	287	13 36.7	230	22 24
30	18 5 14	313	22 1.9	21	21 33	16	21 59 31	287	13 13.7	234	22 25
31	18 10 27	314	−22 4.0	15	21 34	17	22 4 18	286	−12 50.3	238	22 26
Feb. 1	18 15 41	314	22 5.5	8	21 35	18	22 9 4	285	12 26.5	241	22 27
2	18 20 55	314	22 6.3	2	21 36	19	22 13 49	284	12 2.4	244	22 28
3	18 26 9	314	22 6.5	−4	21 38	20	22 18 33	283	11 38.0	247	22 28
4	18 31 23	315	22 6.1	11	21 39	21	22 23 16	282	11 13.3	251	22 29
5	18 36 38	314	−22 5.0	18	21 40	22	22 27 58	281	−10 48.2	253	22 30
6	18 41 52	315	22 3.2	23	21 42	23	22 32 39	281	10 22.9	256	22 31
7	18 47 7	314	22 0.9	30	21 43	24	22 37 20	280	9 57.3	259	22 31
8	18 52 21	315	21 57.9	37	21 44	25	22 42 0	279	9 31.4	262	22 32
9	18 57 36	314	21 54.2	43	21 46	26	22 46 39	278	9 5.2	264	22 33
10	19 2 50	314	−21 49.9	49	21 47	27	22 51 17	278	− 8 38.8	266	22 34
11	19 8 4	314	21 45.0	56	21 48	28	22 55 55	277	8 12.2	269	22 34
12	19 13 18	314	21 39.4	62	21 50	29	23 0 32	276	7 45.3	271	22 35
13	19 18 32	313	21 33.2	69	21 51	30	23 5 8	276	7 18.2	273	22 36
14	19 23 45	313	21 26.3	75	21 52	31	23 9 44	275	6 50.9	275	22 36
15	19 28 58	313	−21 18.8	81	21 53	Apr. 1	23 14 19	274	− 6 23.4	276	22 37
16	19 34 11		−21 10.7		21 55	2	23 18 53		− 5 55.8		22 37

Semidiameter: Jan. 1, 0′.14; Feb. 1, 0′.12; Mar. 1, 0′.10; Apr. 1, 0′.09; May 1, 0′.09; June 1, 0′.08; July 1, 0′.08.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Apr. 1	23 14 19	274	− 6 23.4	276	22 37	May 17	2 45 21	289	+14 47.8	234	23 7
2	23 18 53	274	5 55.8	278	22 37	18	2 50 10	290	15 11.2	231	23 8
3	23 23 27	274	5 28.0	280	22 38	19	2 55 0	291	15 34.3	226	23 8
4	23 28 1	273	5 0.0	282	22 39	20	2 59 51	292	15 56.9	223	23 9
5	23 32 34	273	4 31.8	282	22 39	21	3 4 43	293	16 19.2	218	23 10
6	23 37 7	272	− 4 3.6	284	22 40	22	3 9 36	295	+16 41.0	214	23 11
7	23 41 39	272	3 35.2	285	22 40	23	3 14 31	295	17 2.4	210	23 12
8	23 46 11	272	3 6.7	286	22 41	24	3 19 26	296	17 23.4	205	23 13
9	23 50 43	271	2 38.1	287	22 42	25	3 24 22	298	17 43.9	201	23 14
10	23 55 14	272	2 9.4	288	22 42	26	3 29 20	299	18 4.0	197	23 15
11	23 59 46	271	− 1 40.6	288	22 43	27	3 34 19	299	+18 23.7	191	23 16
12	0 4 17	271	1 11.8	289	22 43	28	3 39 18	301	18 42.8	187	23 18
13	0 8 48	271	0 42.9	289	22 44	29	3 44 19	302	19 1.5	181	23 18
14	0 13 19	270	− 0 14.0	290	22 44	30	3 49 21	303	19 19.6	176	23 20
15	0 17 49	271	+ 0 15.0	290	22 45	31	3 54 24	304	19 37.2	172	23 21
16	0 22 20	271	+ 0 44.0	289	22 46	June 1	3 59 28	306	+19 54.4	166	23 22
17	0 26 51	271	1 12.9	290	22 46	2	4 4 34	306	20 11.0	160	23 23
18	0 31 22	271	1 41.9	290	22 47	3	4 9 40	308	20 27.0	155	23 24
19	0 35 53	271	2 10.9	289	22 47	4	4 14 48	308	20 42.5	149	23 26
20	0 40 24	271	2 39.8	289	22 48	5	4 19 56	310	20 57.4	144	23 27
21	0 44 55	271	+ 3 8.7	288	22 48	6	4 25 6	310	+21 11.8	137	23 28
22	0 49 26	272	3 37.5	288	22 49	7	4 30 16	312	21 25.5	132	23 29
23	0 53 58	272	4 6.3	287	22 50	8	4 35 28	312	21 38.7	126	23 30
24	0 58 30	272	4 35.0	286	22 50	9	4 40 40	313	21 51.3	119	23 32
25	1 3 2	272	5 3.6	286	22 51	10	4 45 53	315	22 3.2	114	23 33
26	1 7 34	273	+ 5 32.2	284	22 51	11	4 51 8	315	+22 14.6	107	23 34
27	1 12 7	273	6 0.6	283	22 52	12	4 56 23	316	22 25.3	100	23 36
28	1 16 40	274	6 28.9	281	22 53	13	5 1 39	317	22 35.3	95	23 37
29	1 21 14	274	6 57.0	280	22 53	14	5 6 56	317	22 44.8	87	23 38
30	1 25 48	275	7 25.0	279	22 54	15	5 12 13	318	22 53.5	81	23 40
May 1	1 30 23	276	+ 7 52.9	277	22 55	16	5 17 31	319	+23 1.6	75	23 41
2	1 34 59	276	8 20.6	275	22 55	17	5 22 50	319	23 9.1	68	23 42
3	1 39 35	276	8 48.1	273	22 56	18	5 28 9	320	23 15.9	61	23 44
4	1 44 11	278	9 15.4	271	22 57	19	5 33 29	321	23 22.0	54	23 45
5	1 48 49	278	9 42.5	269	22 57	20	5 38 50	320	23 27.4	47	23 47
6	1 53 27	278	+10 9.4	267	22 58	21	5 44 10	322	+23 32.1	41	23 48
7	1 58 5	280	10 36.1	265	22 59	22	5 49 32	321	23 36.2	33	23 50
8	2 2 45	280	11 2.6	262	22 59	23	5 54 53	322	23 39.5	27	23 51
9	2 7 25	282	11 28.8	259	23 0	24	6 0 15	322	23 42.2	20	23 52
10	2 12 7	282	11 54.7	256	23 1	25	6 5 37	322	23 44.2	12	23 54
11	2 16 49	283	+12 20.3	254	23 2	26	6 10 59	322	+23 45.4	6	23 55
12	2 21 32	284	12 45.7	251	23 2	27	6 16 21	322	23 46.0	−2	23 57
13	2 26 16	285	13 10.8	248	23 3	28	6 21 43	323	23 45.8	8	23 58
14	2 31 1	285	13 35.6	244	23 4	29	6 27 6	322	23 45.0	16	24 0
15	2 35 46	287	14 0.0	241	23 5	30	6 32 28	322	23 43.4	22	. . . .
16	2 40 33	288	+14 24.1	237	23 6	July 1	6 37 50	322	+23 41.2	30	0 1
17	2 45 21		+14 47.8		23 7	2	6 43 12		+23 38.2		0 2

Hor. Parallax: Jan. 1, 0′.15; Feb. 1, 0′.12; Mar. 1, 0′.11; Apr. 1, 0′.10; May 1, 0′.09; June 1, 0′.09; July 1, 0′.08.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
July 1	6 37 50	322	+23 41.2	30	0 1	Aug. 16	10 30 44	280	+10 54.5	275	0 52
2	6 43 12	321	23 38.2	37	0 2	17	10 35 24	278	10 27.0	278	0 53
3	6 48 33	322	23 34.5	43	0 4	18	10 40 2	279	9 59.2	281	0 54
4	6 53 55	321	23 30.2	51	0 5	19	10 44 41	277	9 31.1	283	0 55
5	6 59 16	320	23 25.1	58	0 7	20	10 49 18	276	9 2.8	286	0 55
6	7 4 36	320	+23 19.3	64	0 8	21	10 53 54	276	+ 8 34.2	288	0 56
7	7 9 56	320	23 12.9	72	0 9	22	10 58 30	275	8 5.4	290	0 57
8	7 15 16	319	23 5.7	78	0 11	23	11 3 5	274	7 36.4	292	0 57
9	7 20 35	318	22 57.9	85	0 12	24	11 7 39	274	7 7.2	294	0 58
10	7 25 53	318	22 49.4	92	0 14	25	11 12 13	273	6 37.8	296	0 58
11	7 31 11	317	+22 40.2	98	0 15	26	11 16 46	273	+ 6 8.2	298	0 59
12	7 36 28	316	22 30.4	105	0 16	27	11 21 19	272	5 38.4	299	1 0
13	7 41 44	316	22 19.9	112	0 18	28	11 25 51	272	5 8.5	301	1 0
14	7 47 0	315	22 8.7	118	0 19	29	11 30 23	271	4 38.4	302	1 1
15	7 52 15	314	21 56.9	124	0 20	30	11 34 54	271	4 8.2	303	1 1
16	7 57 29	312	+21 44.5	131	0 21	31	11 39 25	270	+ 3 37.9	304	1 2
17	8 2 41	312	21 31.4	137	0 23	Sept. 1	11 43 55	270	3 7.5	306	1 3
18	8 7 53	311	21 17.7	143	0 24	2	11 48 25	270	2 36.9	306	1 3
19	8 13 4	310	21 3.4	149	0 25	3	11 52 55	270	2 6.3	306	1 4
20	8 18 14	309	20 48.5	155	0 26	4	11 57 25	269	1 35.7	308	1 4
21	8 23 23	308	+20 33.0	162	0 28	5	12 1 54	269	+ 1 4.9	308	1 5
22	8 28 31	307	20 16.8	166	0 29	6	12 6 23	270	0 34.1	308	1 5
23	8 33 38	306	20 0.2	173	0 30	7	12 10 53	269	+ 0 3.3	309	1 6
24	8 38 44	304	19 42.9	178	0 31	8	12 15 22	269	− 0 27.6	309	1 6
25	8 43 48	304	19 25.1	183	0 32	9	12 19 51	269	0 58.5	308	1 7
26	8 48 52	302	+19 6.8	189	0 33	10	12 24 20	270	− 1 29.3	309	1 8
27	8 53 54	301	18 47.9	195	0 34	11	12 28 50	269	2 0.2	309	1 8
28	8 58 55	300	18 28.4	199	0 36	12	12 33 19	270	2 31.1	308	1 9
29	9 3 55	299	18 8.5	204	0 37	13	12 37 49	270	3 1.9	307	1 9
30	9 8 54	297	17 48.1	210	0 38	14	12 42 19	270	3 32.6	307	1 10
31	9 13 51	297	+17 27.1	214	0 39	15	12 46 49	270	− 4 3.3	307	1 10
Aug. 1	9 18 48	295	17 5.7	219	0 40	16	12 51 19	271	4 34.0	305	1 11
2	9 23 43	294	16 43.8	223	0 41	17	12 55 50	271	5 4.5	305	1 11
3	9 28 37	293	16 21.5	228	0 42	18	13 0 21	271	5 35.0	303	1 12
4	9 33 30	292	15 58.7	233	0 43	19	13 4 52	272	6 5.3	302	1 13
5	9 38 22	291	+15 35.4	236	0 44	20	13 9 24	273	− 6 35.5	301	1 13
6	9 43 13	290	15 11.8	241	0 44	21	13 13 57	273	7 5.6	299	1 14
7	9 48 3	289	14 47.7	245	0 45	22	13 18 30	273	7 35.5	298	1 14
8	9 52 52	287	14 23.2	248	0 46	23	13 23 3	274	8 5.3	296	1 15
9	9 57 39	287	13 58.4	253	0 47	24	13 27 37	275	8 34.9	294	1 16
10	10 2 26	285	+13 33.1	256	0 48	25	13 32 12	275	− 9 4.3	293	1 16
11	10 7 11	285	13 7.5	259	0 49	26	13 36 47	276	9 33.6	290	1 17
12	10 11 56	283	12 41.6	263	0 50	27	13 41 23	277	10 2.6	288	1 18
13	10 16 39	283	12 15.3	266	0 50	28	13 46 0	278	10 31.4	285	1 18
14	10 21 22	281	11 48.7	270	0 51	29	13 50 38	279	10 59.9	284	1 19
15	10 26 3	281	+11 21.7	272	0 52	30	13 55 17	279	−11 28.3	280	1 20
16	10 30 44		+10 54.5		0 52	Oct. 1	13 59 56		−11 56.3		1 20

Semidiameter: July 1, 0′.08; Aug. 1, 0′.08; Sept. 1, 0′.09; Oct. 1, 0′.09; Nov. 1, 0′.10; Dec. 1, 0′.12; Dec. 32, 0′.14.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Oct. 1	13 59 56	280	−11 56.8	278	1 20	Nov. 16	17 53 23	323	−25 10.1	24	2 12
2	14 4 36	282	12 24.1	275	1 21	17	17 58 46	324	25 12.5	16	2 14
3	14 9 18	282	12 51.6	272	1 22	18	18 4 10	323	25 14.1	9	2 15
4	14 14 0	283	13 18.8	269	1 23	19	18 9 33	323	25 15.0	1	2 17
5	14 18 43	284	13 45.7	266	1 23	20	18 14 56	323	25 15.1	6	2 18
6	14 23 27	286	−14 12.3	262	1 24	21	18 20 19	323	−25 14.5	13	2 20
7	14 28 13	286	14 38.5	259	1 25	22	18 25 42	323	25 13.2	21	2 21
8	14 32 59	287	15 4.4	255	1 26	23	18 31 5	322	25 11.1	29	2 23
9	14 37 46	289	15 29.9	252	1 27	24	18 36 27	321	25 8.2	35	2 24
10	14 42 35	290	15 55.1	248	1 28	25	18 41 48	321	25 4.7	44	2 25
11	14 47 25	291	−16 19.9	243	1 28	26	18 47 9	321	−25 0.3	50	2 27
12	14 52 16	292	16 44.2	240	1 29	27	18 52 30	319	24 55.3	58	2 28
13	14 57 8	293	17 8.2	235	1 30	28	18 57 49	320	24 49.5	66	2 30
14	15 2 1	295	17 31.7	231	1 31	29	19 3 9	318	24 42.9	72	2 31
15	15 6 56	295	17 54.8	226	1 32	30	19 8 27	317	24 35.7	80	2 32
16	15 11 51	297	−18 17.4	221	1 33	Dec. 1	19 13 44	317	−24 27.7	87	2 34
17	15 16 48	298	18 39.5	217	1 34	2	19 19 1	315	24 19.0	93	2 35
18	15 21 46	300	19 1.2	212	1 35	3	19 24 16	315	24 9.7	101	2 36
19	15 26 46	300	19 22.4	207	1 36	4	19 29 31	313	23 59.6	108	2 38
20	15 31 46	302	19 43.1	201	1 37	5	19 34 44	313	23 48.8	115	2 39
21	15 36 48	303	−20 3.2	196	1 38	6	19 39 57	311	−23 37.3	121	2 40
22	15 41 51	304	20 22.8	191	1 40	7	19 45 8	310	23 25.2	128	2 42
23	15 46 55	305	20 41.9	186	1 41	8	19 50 18	308	23 12.4	135	2 43
24	15 52 0	307	21 0.5	179	1 42	9	19 55 26	308	22 58.9	141	2 44
25	15 57 7	307	21 18.4	174	1 43	10	20 0 34	306	22 44.8	147	2 45
26	16 2 14	309	−21 35.8	168	1 44	11	20 5 40	304	−22 30.1	154	2 46
27	16 7 23	310	21 52.6	162	1 45	12	20 10 44	304	22 14.7	160	2 47
28	16 12 33	311	22 8.8	156	1 46	13	20 15 48	301	21 58.7	165	2 48
29	16 17 44	312	22 24.4	150	1 48	14	20 20 49	300	21 42.2	172	2 50
30	16 22 56	313	22 39.4	143	1 49	15	20 25 49	299	21 25.0	178	2 51
31	16 28 9	314	−22 53.7	137	1 50	16	20 30 48	297	−21 7.2	183	2 52
Nov. 1	16 33 23	315	23 7.4	130	1 52	17	20 35 45	296	20 48.9	189	2 53
2	16 38 38	316	23 20.4	124	1 53	18	20 40 41	293	20 30.0	194	2 54
3	16 43 54	317	23 32.8	117	1 54	19	20 45 34	293	20 10.6	200	2 55
4	16 49 11	317	23 44.5	111	1 56	20	20 50 27	290	19 50.6	205	2 56
5	16 54 28	319	−23 55.6	103	1 57	21	20 55 17	289	−19 30.1	210	2 56
6	16 59 47	319	24 5.9	96	1 58	22	21 0 6	287	19 9.1	215	2 57
7	17 5 6	320	24 15.5	90	2 0	23	21 4 53	286	18 47.6	219	2 58
8	17 10 26	320	24 24.5	82	2 1	24	21 9 39	284	18 25.7	225	2 59
9	17 15 46	322	24 32.7	75	2 2	25	21 14 23	282	18 3.2	228	3 0
10	17 21 8	321	−24 40.2	69	2 4	26	21 19 5	280	−17 40.4	234	3 0
11	17 26 29	322	24 47.1	60	2 5	27	21 23 45	279	17 17.0	237	3 1
12	17 31 51	323	24 53.1	54	2 7	28	21 28 24	277	16 53.3	242	3 2
13	17 37 14	323	24 58.5	46	2 8	29	21 33 1	275	16 29.1	246	3 3
14	17 42 37	323	25 3.1	39	2 10	30	21 37 36	274	16 4.5	250	3 3
15	17 48 0	323	−25 7.0	31	2 11	31	21 42 10	272	−15 39.5	253	3 4
16	17 53 23		−25 10.1		2 12	32	21 46 42		−15 14.2		3 4

Hor. Parallax: July 1, 0′.08; Aug. 1, 0′.09; Sept. 1, 0′.09; Oct. 1, 0′.10; Nov. 1, 0′.11; Dec. 1, 0′.12; Dec. 32, 0′.15.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Jan. 1	13 4 45	108	− 4 47.2	107	18 24	Feb. 16	14 14 3	62	−11 5.1	50	16 31
2	13 6 33	109	4 57.9	107	18 22	17	14 15 5	60	11 10.1	49	16 28
3	13 8 22	107	5 8.6	105	18 19	18	14 16 5	59	11 15.0	48	16 25
4	13 10 9	107	5 19.1	105	18 17	19	14 17 4	57	11 19.8	46	16 22
5	13 11 56	107	5 29.6	103	18 15	20	14 18 1	55	11 24.4	44	16 19
6	13 13 43	105	− 5 39.9	103	18 13	21	14 18 56	53	−11 28.8	42	16 16
7	13 15 28	106	5 50.2	102	18 11	22	14 19 49	51	11 33.0	41	16 13
8	13 17 14	104	6 0.4	100	18 9	23	14 20 40	50	11 37.1	40	16 10
9	13 18 58	104	6 10.4	100	18 6	24	14 21 30	47	11 41.1	37	16 7
10	13 20 42	104	6 20.4	99	18 4	25	14 22 17	45	11 44.8	36	16 4
11	13 22 26	102	− 6 30.3	98	18 2	26	14 23 2	43	−11 48.4	34	16 1
12	13 24 8	102	6 40.1	96	18 0	27	14 23 45	41	11 51.8	33	15 58
13	13 25 50	102	6 49.7	96	17 57	28	14 24 26	38	11 55.1	31	15 54
14	13 27 32	100	6 59.3	94	17 55	29	14 25 4	36	11 58.2	29	15 51
15	13 29 12	100	7 8.7	93	17 53	Mar. 1	14 25 40	35	12 1.1	27	15 48
16	13 30 52	99	− 7 18.0	93	17 51	2	14 26 15	31	−12 3.8	25	15 44
17	13 32 31	98	7 27.3	91	17 48	3	14 26 46	30	12 6.3	24	15 41
18	13 34 9	97	7 36.4	90	17 46	4	14 27 16	27	12 8.7	22	15 37
19	13 35 46	97	7 45.4	88	17 44	5	14 27 43	24	12 10.9	20	15 34
20	13 37 23	96	7 54.2	88	17 41	6	14 28 7	22	12 12.9	18	15 30
21	13 38 59	94	− 8 3.0	86	17 39	7	14 28 29	19	−12 14.7	16	15 26
22	13 40 33	94	8 11.6	86	17 37	8	14 28 48	17	12 16.3	15	15 23
23	13 42 7	93	8 20.2	83	17 34	9	14 29 5	14	12 17.8	12	15 19
24	13 43 40	92	8 28.5	83	17 32	10	14 29 19	12	12 19.0	11	15 16
25	13 45 12	91	8 36.8	82	17 29	11	14 29 31	8	12 20.1	8	15 12
26	13 46 43	90	− 8 45.0	80	17 27	12	14 29 39	6	−12 20.9	7	15 8
27	13 48 13	89	8 53.0	79	17 24	13	14 29 45	3	12 21.6	5	15 4
28	13 49 42	88	9 0.9	78	17 22	14	14 29 48	0	12 22.1	2	15 0
29	13 51 10	87	9 8.7	76	17 20	15	14 29 48	3	12 22.3	1	14 56
30	13 52 37	86	9 16.3	75	17 17	16	14 29 45	6	12 22.4	1	14 52
31	13 54 3	84	− 9 23.8	74	17 15	17	14 29 39	9	−12 22.3	4	14 48
Feb. 1	13 55 27	84	9 31.2	72	17 12	18	14 29 30	11	12 21.9	5	14 44
2	13 56 51	82	9 38.4	71	17 10	19	14 29 19	15	12 21.4	8	14 40
3	13 58 13	82	9 45.5	70	17 7	20	14 29 4	18	12 20.6	9	14 36
4	13 59 35	79	9 52.5	69	17 4	21	14 28 46	21	12 19.7	12	14 31
5	14 0 54	79	− 9 59.4	66	17 2	22	14 28 25	24	−12 18.5	14	14 27
6	14 2 13	78	10 6.0	66	16 59	23	14 28 1	27	12 17.1	15	14 23
7	14 3 31	76	10 12.6	64	16 56	24	14 27 34	30	12 15.6	18	14 18
8	14 4 47	74	10 19.0	63	16 54	25	14 27 4	34	12 13.8	20	14 14
9	14 6 1	74	10 25.3	61	16 51	26	14 26 30	36	12 11.8	21	14 9
10	14 7 15	71	−10 31.4	60	16 48	27	14 25 54	39	−12 9.7	24	14 5
11	14 8 26	71	10 37.4	58	16 46	28	14 25 15	42	12 7.3	26	14 0
12	14 9 37	69	10 43.2	57	16 43	29	14 24 33	45	12 4.7	28	13 56
13	14 10 46	67	10 48.9	56	16 40	30	14 23 48	48	12 1.9	29	13 51
14	14 11 53	66	10 54.5	53	16 37	31	14 23 0	51	11 59.0	32	13 46
15	14 12 59	64	−10 59.8	53	16 34	Apr. 1	14 22 9	54	−11 55.8	33	13 41
16	14 14 3		−11 5.1		16 31	2	14 21 15		−11 52.5		13 36

Semidiameter: Jan. 1, 0′.05; Feb. 1, 0′.07; Mar. 1, 0′.09; Apr. 1, 0′.12; May 1, 0′.13; June 1, 0′.12; July 1, 0′.09.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.	Apparent Declination. Noon.	Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.	Apparent Declination. Noon.	Transit, Meridian of Greenwich.
	h m s	° ′	h m		h m s	° ′	h m
Apr. 1	14 22 9 54	−11 55.8 33	13 41	May 17	13 24 26 46	− 8 24.7 18	9 43
2	14 21 15 56	11 52.5 36	13 36	18	13 23 40 43	8 22.9 15	9 38
3	14 20 19 59	11 48.9 37	13 32	19	13 22 57 40	8 21.4 13	9 34
4	14 19 20 62	11 45.2 39	13 27	20	13 22 17 37	8 20.1 9	9 29
5	14 18 18 64	11 41.3 41	13 22	21	13 21 40 34	8 19.2 7	9 25
6	14 17 14 67	−11 37.2 42	13 17	22	13 21 6 31	− 8 18.5 5	9 20
7	14 16 7 69	11 33.0 44	13 12	23	13 20 35 28	8 18.0 1	9 16
8	14 14 58 72	11 28.6 46	13 6	24	13 20 7 25	8 17.9 1	9 11
9	14 13 46 74	11 24.0 47	13 1	25	13 19 42 21	8 18.0 4	9 7
10	14 12 32 75	11 19.3 48	12 56	26	13 19 21 18	8 18.4 7	9 3
11	14 11 17 78	−11 14.5 50	12 51	27	13 19 3 16	− 8 19.1 10	8 58
12	14 9 59 80	11 9.5 51	12 46	28	13 18 47 12	8 20.1 12	8 54
13	14 8 39 81	11 4.4 52	12 40	29	13 18 35 9	8 21.3 15	8 50
14	14 7 18 83	10 59.2 54	12 35	30	13 18 26 6	8 22.8 18	8 46
15	14 5 55 85	10 53.8 54	12 30	31	13 18 20 3	8 24.6 20	8 42
16	14 4 30 85	−10 48.4 55	12 24	June 1	13 18 17 0	− 8 26.6 23	8 38
17	14 3 5 87	10 42.9 56	12 19	2	13 18 17 2	8 28.9 25	8 34
18	14 1 38 87	10 37.3 56	12 14	3	13 18 19 6	8 31.4 29	8 30
19	14 0 11 89	10 31.7 57	12 8	4	13 18 25 9	8 34.3 30	8 27
20	13 58 42 89	10 26.0 57	12 3	5	13 18 34 11	8 37.3 33	8 23
21	13 57 13 89	−10 20.3 57	11 58	6	13 18 45 15	− 8 40.6 36	8 19
22	13 55 44 89	10 14.6 58	11 52	7	13 19 0 17	8 44.2 38	8 15
23	13 54 15 90	10 8.8 57	11 47	8	13 19 17 20	8 48.0 41	8 12
24	13 52 45 89	10 3.1 56	11 41	9	13 19 37 22	8 52.1 42	8 8
25	13 51 16 89	9 57.5 57	11 36	10	13 19 59 25	8 56.3 46	8 5
26	13 49 47 88	− 9 51.8 56	11 30	11	13 20 24 28	− 9 0.9 47	8 1
27	13 48 19 88	9 46.2 55	11 25	12	13 20 52 31	9 5.6 50	7 58
28	13 46 51 86	9 40.7 54	11 20	13	13 21 23 33	9 10.6 51	7 54
29	13 45 25 86	9 35.3 54	11 14	14	13 21 56 36	9 15.7 54	7 51
30	13 43 59 85	9 29.9 52	11 9	15	13 22 32 38	9 21.1 57	7 48
May 1	13 42 34 83	− 9 24.7 51	11 4	16	13 23 10 41	− 9 26.8 58	7 44
2	13 41 11 82	9 19.6 50	10 58	17	13 23 51 44	9 32.6 60	7 41
3	13 39 49 80	9 14.6 48	10 53	18	13 24 35 45	9 38.6 62	7 38
4	13 38 29 78	9 9.8 47	10 48	19	13 25 20 48	9 44.8 65	7 35
5	13 37 11 77	9 5.1 45	10 43	20	13 26 8 51	9 51.3 66	7 32
6	13 35 54 74	− 9 0.6 44	10 37	21	13 26 59 53	− 9 57.9 68	7 28
7	13 34 40 73	8 56.2 41	10 32	22	13 27 52 55	10 4.7 69	7 26
8	13 33 27 70	8 52.1 40	10 27	23	13 28 47 57	10 11.6 72	7 22
9	13 32 17 68	8 48.1 37	10 22	24	13 29 44 59	10 18.8 73	7 20
10	13 31 9 65	8 44.4 35	10 17	25	13 30 43 62	10 26.1 75	7 17
11	13 30 4 63	− 8 40.9 33	10 12	26	13 31 45 64	−10 33.6 76	7 14
12	13 29 1 61	8 37.6 31	10 7	27	13 32 49 65	10 41.2 78	7 11
13	13 28 0 58	8 34.5 28	10 2	28	13 33 54 68	10 49.0 79	7 8
14	13 27 2 54	8 31.7 26	9 57	29	13 35 2 70	10 56.9 81	7 5
15	13 26 8 53	8 29.1 23	9 52	30	13 36 12 72	11 5.0 82	7 2
16	13 25 15 49	− 8 26.8 21	9 48	July 1	13 37 24 73	−11 13.2 84	7 0
17	13 24 26	− 8 24.7	9 43	2	13 38 37	−11 21.6	6 57

Hor. Parallax: Jan. 1, 0′.10; Feb. 1, 0′.13; Mar. 1, 0′.17; Apr. 1, 0′.22; May 1, 0′.25; June 1, 0′.22; July 1, 0′.17.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m
July 1	13 37 24	73	−11 13.2	84	7 0
2	13 38 37	76	11 21.6	85	6 57
3	13 39 53	77	11 30.1	86	6 54
4	13 41 10	80	11 38.7	87	6 52
5	13 42 30	81	11 47.4	89	6 49
6	13 43 51	83	−11 56.3	89	6 46
7	13 45 14	84	12 5.2	91	6 44
8	13 46 38	86	12 14.3	92	6 41
9	13 48 4	88	12 23.5	93	6 39
10	13 49 32	90	12 32.8	94	6 36
11	13 51 2	92	−12 42.2	94	6 34
12	13 52 34	93	12 51.6	96	6 32
13	13 54 7	94	13 1.2	96	6 29
14	13 55 41	97	13 10.8	98	6 27
15	13 57 18	98	13 20.6	98	6 24
16	13 58 56	99	−13 30.4	99	6 22
17	14 0 35	101	13 40.3	99	6 20
18	14 2 16	103	13 50.2	100	6 18
19	14 3 59	104	14 0.2	101	6 16
20	14 5 43	106	14 10.3	101	6 13
21	14 7 29	107	−14 20.4	102	6 11
22	14 9 16	109	14 30.6	102	6 9
23	14 11 5	110	14 40.8	103	6 7
24	14 12 55	111	14 51.1	103	6 5
25	14 14 46	113	15 1.4	103	6 3
26	14 16 39	114	−15 11.7	104	6 1
27	14 18 33	116	15 22.1	104	5 59
28	14 20 29	117	15 32.5	104	5 57
29	14 22 26	118	15 42.9	105	5 55
30	14 24 24	119	15 53.4	104	5 53
31	14 26 23	121	−16 3.8	105	5 51
Aug. 1	14 28 24	122	16 14.3	105	5 49
2	14 30 26	124	16 24.8	104	5 47
3	14 32 30	124	16 35.2	105	5 45
4	14 34 34	126	16 45.7	105	5 43
5	14 36 40	128	−16 56.2	104	5 41
6	14 38 48	128	17 6.6	104	5 40
7	14 40 56	130	17 17.0	105	5 38
8	14 43 6	130	17 27.5	104	5 36
9	14 45 16	133	17 37.9	104	5 34
10	14 47 29	133	−17 48.3	103	5 32
11	14 49 42	135	17 58.6	103	5 31
12	14 51 57	135	18 8.9	103	5 29
13	14 54 12	137	18 19.2	103	5 27
14	14 56 29	138	18 29.5	102	5 26
15	14 58 47	140	−18 39.7	101	5 24
16	15 1 7		−18 49.8		5 22

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m
Aug. 16	15 1 7	140	−18 49.8	101	5 22
17	15 3 27	142	18 59.9	101	5 21
18	15 5 49	143	19 10.0	100	5 19
19	15 8 12	144	19 20.0	99	5 18
20	15 10 36	145	19 29.9	99	5 16
21	15 13 1	146	−19 39.8	97	5 15
22	15 15 27	147	19 49.5	98	5 13
23	15 17 54	149	19 59.3	96	5 12
24	15 20 23	149	20 8.9	95	5 10
25	15 22 52	151	20 18.4	95	5 9
26	15 25 23	151	−20 27.9	94	5 7
27	15 27 54	153	20 37.3	93	5 6
28	15 30 27	154	20 46.6	91	5 4
29	15 33 1	154	20 55.7	91	5 3
30	15 35 35	156	21 4.8	90	5 2
31	15 38 11	157	−21 13.8	88	5 0
Sept. 1	15 40 48	158	21 22.6	88	4 59
2	15 43 26	158	21 31.4	86	4 58
3	15 46 4	160	21 40.0	85	4 56
4	15 48 44	161	21 48.5	84	4 55
5	15 51 25	162	−21 56.9	83	4 54
6	15 54 7	163	22 5.2	81	4 53
7	15 56 50	163	22 13.3	80	4 52
8	15 59 33	165	22 21.3	78	4 50
9	16 2 18	166	22 29.1	77	4 49
10	16 5 4	167	−22 36.8	76	4 48
11	16 7 51	167	22 44.4	74	4 47
12	16 10 38	169	22 51.8	72	4 46
13	16 13 27	169	22 59.0	71	4 44
14	16 16 16	171	23 6.1	70	4 43
15	16 19 7	171	−23 13.1	67	4 42
16	16 21 58	172	23 19.8	66	4 41
17	16 24 50	173	23 26.4	65	4 40
18	16 27 43	174	23 32.9	62	4 39
19	16 30 37	175	23 39.1	61	4 38
20	16 33 32	176	−23 45.2	59	4 37
21	16 36 28	176	23 51.1	57	4 36
22	16 39 24	177	23 56.8	55	4 35
23	16 42 21	178	24 2.3	53	4 34
24	16 45 19	179	24 7.6	52	4 33
25	16 48 18	179	−24 12.8	49	4 32
26	16 51 17	181	24 17.7	47	4 31
27	16 54 18	181	24 22.4	45	4 30
28	16 57 19	181	24 26.9	44	4 29
29	17 0 20	183	24 31.3	41	4 28
30	17 3 23	183	−24 35.4	38	4 28
Oct. 1	17 6 26		−24 39.2		4 27

Semidiameter: July 1, 0′.09; Aug. 1, 0′.08; Sept. 1, 0′.06; Oct. 1, 0′.06; Nov. 1, 0′.05; Dec. 1, 0′.05; Dec. 32, 0′.04.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Oct. 1	17 6 26	184	−24 39.2	37	4 27	Nov. 16	19 34 13	195	−23 14.9	78	3 53
2	17 9 30	184	24 42.9	35	4 26	17	19 37 28	195	23 7.1	81	3 52
3	17 12 34	185	24 46.4	32	4 25	18	19 40 43	195	22 59.0	84	3 52
4	17 15 39	186	24 49.6	30	4 24	19	19 43 58	195	22 50.6	86	3 51
5	17 18 45	186	24 52.6	28	4 23	20	19 47 13	195	22 42.0	88	3 50
6	17 21 51	187	−24 55.4	26	4 22	21	19 50 28	194	−22 33.2	91	3 50
7	17 24 58	187	24 58.0	23	4 22	22	19 53 42	194	22 24.1	93	3 49
8	17 28 5	188	25 0.3	21	4 21	23	19 56 56	194	22 14.8	96	3 48
9	17 31 13	189	25 2.4	18	4 20	24	20 0 10	194	22 5.2	97	3 48
10	17 34 22	189	25 4.2	17	4 19	25	20 3 24	193	21 55.5	101	3 47
11	17 37 31	190	−25 5.9	13	4 18	26	20 6 37	193	−21 45.4	102	3 46
12	17 40 41	190	25 7.2	12	4 18	27	20 9 50	193	21 35.2	105	3 45
13	17 43 51	191	25 8.4	9	4 17	28	20 13 3	192	21 24.7	107	3 45
14	17 47 2	191	25 9.3	6	4 16	29	20 16 15	192	21 14.0	110	3 44
15	17 50 13	192	25 9.9	4	4 15	30	20 19 27	192	21 3.0	112	3 43
16	17 53 25	192	−25 10.3	1	4 14	Dec. 1	20 22 39	191	−20 51.8	113	3 42
17	17 56 37	192	25 10.4	1	4 14	2	20 25 50	191	20 40.5	117	3 42
18	17 59 49	193	25 10.3	3	4 13	3	20 29 1	191	20 28.8	118	3 41
19	18 3 2	193	25 10.0	6	4 12	4	20 32 12	190	20 17.0	120	3 40
20	18 6 15	193	25 9.4	9	4 12	5	20 35 22	190	20 5.0	123	3 39
21	18 9 28	194	−25 8.5	11	4 11	6	20 38 32	190	−19 52.7	124	3 39
22	18 12 42	194	25 7.4	14	4 10	7	20 41 42	189	19 40.3	127	3 38
23	18 15 56	195	25 6.0	16	4 9	8	20 44 51	189	19 27.6	128	3 37
24	18 19 11	194	25 4.4	19	4 9	9	20 48 0	189	19 14.8	131	3 36
25	18 22 25	195	25 2.5	22	4 8	10	20 51 9	188	19 1.7	133	3 35
26	18 25 40	195	−25 0.3	24	4 7	11	20 54 17	188	−18 48.4	134	3 35
27	18 28 55	195	24 57.9	26	4 7	12	20 57 25	187	18 35.0	136	3 34
28	18 32 10	196	24 55.3	30	4 6	13	21 0 32	187	18 21.4	139	3 33
29	18 35 26	195	24 52.3	32	4 5	14	21 3 39	186	18 7.5	140	3 32
30	18 38 41	196	24 49.1	34	4 5	15	21 6 45	186	17 53.5	142	3 31
31	18 41 57	196	−24 45.7	37	4 4	16	21 9 51	186	−17 39.3	143	3 30
Nov. 1	18 45 13	195	24 42.0	40	4 3	17	21 12 57	185	17 25.0	146	3 30
2	18 48 28	196	24 38.0	42	4 2	18	21 16 2	185	17 10.4	147	3 29
3	18 51 44	196	24 33.8	46	4 2	19	21 19 7	184	16 55.7	148	3 28
4	18 55 0	197	24 29.2	47	4 1	20	21 22 11	184	16 40.9	151	3 27
5	18 58 17	196	−24 24.5	50	4 0	21	21 25 15	184	−16 25.8	152	3 26
6	19 1 33	196	24 19.5	53	4 0	22	21 28 19	183	16 10.6	153	3 25
7	19 4 49	196	24 14.2	56	3 59	23	21 31 22	182	15 55.3	155	3 24
8	19 8 5	196	24 8.6	58	3 58	24	21 34 24	182	15 39.8	157	3 23
9	19 11 21	196	24 2.8	61	3 58	25	21 37 26	182	15 24.1	158	3 22
10	19 14 37	197	−23 56.7	63	3 57	26	21 40 28	181	−15 8.3	159	3 22
11	19 17 54	196	23 50.4	66	3 56	27	21 43 29	181	14 52.4	161	3 21
12	19 21 10	196	23 43.8	68	3 56	28	21 46 30	181	14 36.3	163	3 20
13	19 24 26	196	23 37.0	71	3 55	29	21 49 31	180	14 20.0	163	3 19
14	19 27 41	196	23 29.9	74	3 54	30	21 52 31	179	14 3.7	165	3 18
15	19 30 57	196	−23 22.5	76	3 54	31	21 55 30	180	−13 47.2	166	3 17
16	19 34 13		−23 14.9		3 53	32	21 58 30		−13 30.6		3 16

Hor. Parallax: July 1, 0′.17; Aug. 1, 0′.14; Sept. 1, 0′.12; Oct. 1, 0′.11; Nov. 1, 0′.09; Dec. 1, 0′.09; Dec. 32, 0′.08.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Jan. 1	9 18 39	20	+16 31.0	17	14 37	Feb. 16	8 56 34	30	+18 13.9	21	11 14
2	9 18 19	21	16 32.7	18	14 32	17	8 56 4	29	18 16.0	21	11 9
3	9 17 58	21	16 34.5	19	14 28	18	8 55 35	30	18 18.1	21	11 5
4	9 17 37	22	16 36.4	19	14 24	19	8 55 5	29	18 20.2	20	11 0
5	9 17 15	23	16 38.3	19	14 20	20	8 54 36	28	18 22.2	20	10 56
6	9 16 52	23	+16 40.2	20	14 15	21	8 54 8	29	+18 24.2	19	10 52
7	9 16 29	24	16 42.2	20	14 11	22	8 53 39	28	18 26.1	19	10 47
8	9 16 5	25	16 44.2	20	14 6	23	8 53 11	27	18 28.0	19	10 43
9	9 15 40	25	16 46.2	21	14 2	24	8 52 44	27	18 29.9	18	10 38
10	9 15 15	25	16 48.3	21	13 58	25	8 52 17	26	18 31.7	18	10 34
11	9 14 50	26	+16 50.4	22	13 54	26	8 51 51	26	+18 33.5	18	10 30
12	9 14 24	26	16 52.6	22	13 49	27	8 51 25	26	18 35.3	17	10 25
13	9 13 58	27	16 54.8	22	13 45	28	8 50 59	25	18 37.0	17	10 21
14	9 13 31	28	16 57.0	22	13 40	29	8 50 34	24	18 38.7	16	10 17
15	9 13 3	28	16 59.2	23	13 36	Mar. 1	8 50 10	24	18 40.3	16	10 12
16	9 12 35	28	+17 1.5	22	13 32	2	8 49 46	23	+18 41.9	15	10 8
17	9 12 7	29	17 3.7	23	13 27	3	8 49 23	23	18 43.4	15	10 4
18	9 11 38	29	17 6.0	24	13 23	4	8 49 0	22	18 44.9	14	9 59
19	9 11 9	29	17 8.4	23	13 18	5	8 48 38	21	18 46.3	14	9 55
20	9 10 40	30	17 10.7	24	13 14	6	8 48 17	21	18 47.7	14	9 51
21	9 10 10	30	+17 13.1	23	13 10	7	8 47 56	20	+18 49.1	13	9 47
22	9 9 40	30	17 15.4	24	13 5	8	8 47 36	20	18 50.4	12	9 42
23	9 9 10	31	17 17.8	24	13 1	9	8 47 16	19	18 51.6	12	9 38
24	9 8 39	31	17 20.2	24	12 56	10	8 46 57	18	18 52.8	12	9 34
25	9 8 8	31	17 22.6	24	12 52	11	8 46 39	17	18 54.0	11	9 30
26	9 7 37	31	+17 25.0	24	12 47	12	8 46 22	17	+18 55.1	11	9 25
27	9 7 6	32	17 27.4	24	12 43	13	8 46 5	16	18 56.2	10	9 21
28	9 6 34	31	17 29.8	24	12 38	14	8 45 49	16	18 57.2	9	9 17
29	9 6 3	32	17 32.2	25	12 34	15	8 45 33	14	18 58.1	9	9 13
30	9 5 31	32	17 34.7	24	12 30	16	8 45 19	14	18 59.0	9	9 9
31	9 4 59	32	+17 37.1	24	12 25	17	8 45 5	13	+18 59.9	8	9 4
Feb. 1	9 4 27	32	17 39.5	24	12 20	18	8 44 52	13	19 0.7	8	9 0
2	9 3 55	32	17 41.9	24	12 16	19	8 44 39	12	19 1.5	7	8 56
3	9 3 23	32	17 44.3	24	12 12	20	8 44 27	10	19 2.2	6	8 52
4	9 2 51	32	17 46.6	24	12 7	21	8 44 17	11	19 2.8	6	8 48
5	9 2 19	32	+17 49.0	24	12 3	22	8 44 6	9	+19 3.4	6	8 44
6	9 1 47	32	17 51.4	23	11 58	23	8 43 57	9	19 4.0	5	8 40
7	9 1 15	32	17 53.7	24	11 54	24	8 43 48	8	19 4.5	4	8 36
8	9 0 43	31	17 56.1	23	11 49	25	8 43 40	7	19 4.9	4	8 32
9	9 0 12	32	17 58.4	23	11 45	26	8 43 33	6	19 5.3	4	8 28
10	8 59 40	31	+18 0.7	22	11 40	27	8 43 27	6	+19 5.7	3	8 24
11	8 59 9	32	18 2.9	23	11 36	28	8 43 21	4	19 6.0	2	8 20
12	8 58 37	31	18 5.2	22	11 32	29	8 43 17	4	19 6.2	2	8 16
13	8 58 6	31	18 7.4	22	11 27	30	8 43 13	4	19 6.4	1	8 12
14	8 57 35	30	18 9.6	22	11 23	31	8 43 9	2	19 6.5	1	8 8
15	8 57 5	31	+18 11.8	21	11 18	Apr. 1	8 43 7	2	+19 6.6	1	8 4
16	8 56 34		+18 13.9		11 14	2	8 43 5		+19 6.7		8 0

Polar Semidiameter: Jan. 1, 0′.34; Feb. 1, 0′.35; Mar. 1, 0′.34; Apr. 1, 0′.32; May 1, 0′.29; June 1, 0′.27; July 1, 0′.25.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Apr. 1	8 43 7	2	+19 6.6	1	8 4	May 17	8 54 15	30	+18 19.5	21	5 14
2	8 43 5	1	19 6.7	0	8 0	18	8 54 45	29	18 17.4	21	5 10
3	8 43 4	0	19 6.7	1	7 56	19	8 55 14	31	18 15.3	21	5 7
4	8 43 4	1	19 6.6	1	7 52	20	8 55 45	31	18 13.2	22	5 4
5	8 43 5	1	19 6.5	2	7 48	21	8 56 16	31	18 11.0	22	5 0
6	8 43 6	3	+19 6.3	2	7 44	22	8 56 47	32	+18 8.8	22	4 57
7	8 43 9	3	19 6.1	2	7 40	23	8 57 19	32	18 6.6	23	4 53
8	8 43 12	3	19 5.9	3	7 36	24	8 57 51	33	18 4.3	24	4 50
9	8 43 15	5	19 5.6	4	7 32	25	8 58 24	34	18 1.9	23	4 47
10	8 43 20	5	19 5.2	4	7 28	26	8 58 58	33	17 59.6	24	4 43
11	8 43 25	6	+19 4.8	5	7 25	27	8 59 31	34	+17 57.2	24	4 40
12	8 43 31	7	19 4.3	5	7 21	28	9 0 5	35	17 54.8	25	4 36
13	8 43 38	7	19 3.8	5	7 17	29	9 0 40	35	17 52.3	25	4 33
14	8 43 45	8	19 3.3	6	7 13	30	9 1 15	36	17 49.8	26	4 30
15	8 43 53	9	19 2.7	7	7 9	31	9 1 51	36	17 47.2	26	4 26
16	8 44 2	10	+19 2.0	7	7 6	June 1	9 2 27	36	+17 44.6	26	4 23
17	8 44 12	10	19 1.3	7	7 2	2	9 3 3	37	17 42.0	26	4 20
18	8 44 22	12	19 0.6	8	6 58	3	9 3 40	37	17 39.4	27	4 16
19	8 44 34	12	18 59.8	8	6 54	4	9 4 17	37	17 36.7	27	4 13
20	8 44 46	12	18 59.0	9	6 51	5	9 4 54	38	17 34.0	28	4 10
21	8 44 58	14	+18 58.1	10	6 47	6	9 5 32	39	+17 31.2	28	4 7
22	8 45 12	14	18 57.1	9	6 43	7	9 6 11	38	17 28.4	28	4 3
23	8 45 26	14	18 56.2	11	6 40	8	9 6 49	39	17 25.6	29	4 0
24	8 45 40	16	18 55.1	10	6 36	9	9 7 28	40	17 22.7	29	3 57
25	8 45 56	16	18 54.1	12	6 32	10	9 8 8	39	17 19.8	29	3 54
26	8 46 12	17	+18 52.9	11	6 28	11	9 8 47	40	+17 16.9	30	3 50
27	8 46 29	17	18 51.8	12	6 25	12	9 9 27	41	17 13.9	30	3 47
28	8 46 46	18	18 50.6	13	6 21	13	9 10 8	41	17 10.9	30	3 44
29	8 47 4	19	18 49.3	13	6 18	14	9 10 49	41	17 7.9	31	3 40
30	8 47 23	19	18 48.0	13	6 14	15	9 11 30	41	17 4.8	31	3 37
May 1	8 47 42	20	+18 46.7	14	6 10	16	9 12 11	42	+17 1.7	31	3 34
2	8 48 2	21	18 45.3	14	6 7	17	9 12 53	42	16 58.6	32	3 31
3	8 48 23	21	18 43.9	15	6 3	18	9 13 35	42	16 55.4	31	3 27
4	8 48 44	22	18 42.4	15	6 0	19	9 14 17	43	16 52.3	33	3 24
5	8 49 6	23	18 40.9	16	5 56	20	9 15 0	43	16 49.0	32	3 21
6	8 49 29	23	+18 39.3	16	5 52	21	9 15 43	43	+16 45.8	33	3 18
7	8 49 52	24	18 37.7	16	5 49	22	9 16 26	44	16 42.5	33	3 14
8	8 50 16	24	18 36.1	17	5 45	23	9 17 10	44	16 39.2	34	3 11
9	8 50 40	25	18 34.4	17	5 42	24	9 17 54	44	16 35.8	33	3 8
10	8 51 5	26	18 32.7	18	5 38	25	9 18 38	44	16 32.5	34	3 5
11	8 51 31	26	+18 30.9	18	5 35	26	9 19 22	44	+16 29.1	35	3 2
12	8 51 57	26	18 29.1	18	5 31	27	9 20 6	45	16 25.6	34	2 58
13	8 52 23	27	18 27.3	19	5 28	28	9 20 51	45	16 22.2	35	2 55
14	8 52 50	28	18 25.4	19	5 24	29	9 21 36	45	16 18.7	35	2 52
15	8 53 18	28	18 23.5	20	5 21	30	9 22 21	46	16 15.2	36	2 49
16	8 53 46	29	+18 21.5	20	5 17	July 1	9 23 7	45	+16 11.6	36	2 46
17	8 54 15		+18 19.5		5 14	2	9 23 52		+16 8.0		2 43

Hor. Parallax: Jan. 1, 0′.03; Feb. 1, 0′.03; Mar. 1, 0′.03; Apr. 1, 0′.03; May 1, 0′.03; June 1, 0′.03; July 1, 0′.02.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m
July 1	9 23 7	45	+16 11.6	36	2 46
2	9 23 52	46	16 8.0	35	2 43
3	9 24 38	47	16 4.5	37	2 40
4	9 25 25	46	16 0.8	36	2 36
5	9 26 11	46	15 57.2	37	2 33
6	9 26 57	47	+15 53.5	37	2 30
7	9 27 44	47	15 49.8	37	2 27
8	9 28 31	47	15 46.1	38	2 24
9	9 29 18	47	15 42.3	38	2 20
10	9 30 5	48	15 38.5	38	2 17
11	9 30 53	47	+15 34.7	38	2 14
12	9 31 40	48	15 30.9	39	2 11
13	9 32 28	48	15 27.0	39	2 8
14	9 33 16	48	15 23.1	39	2 5
15	9 34 4	48	15 19.2	39	2 2
16	9 34 52	49	+15 15.3	39	1 58
17	9 35 41	48	15 11.4	40	1 55
18	9 36 29	49	15 7.4	40	1 52
19	9 37 18	49	15 3.4	40	1 49
20	9 38 7	49	14 59.4	41	1 46
21	9 38 56	49	+14 55.3	40	1 43
22	9 39 45	49	14 51.3	41	1 40
23	9 40 34	49	14 47.2	41	1 37
24	9 41 23	49	14 43.1	41	1 34
25	9 42 12	50	14 39.0	42	1 30
26	9 43 2	49	+14 34.8	41	1 27
27	9 43 51	50	14 30.7	42	1 24
28	9 44 41	50	14 26.5	42	1 21
29	9 45 31	49	14 22.3	42	1 18
30	9 46 20	50	14 18.1	42	1 15
31	9 47 10	50	+14 13.9	43	1 12
Aug. 1	9 48 0	50	14 9.6	42	1 9
2	9 48 50	50	14 5.4	43	1 6
3	9 49 40	50	14 1.1	43	1 2
4	9 50 30	50	13 56.8	43	0 59
5	9 51 20	51	+13 52.5	43	0 56
6	9 52 11	50	13 48.2	44	0 53
7	9 53 1	50	13 43.8	43	0 50
8	9 53 51	51	13 39.5	44	0 47
9	9 54 42	50	13 35.1	44	0 44
10	9 55 32	50	+13 30.7	44	0 41
11	9 56 22	51	13 26.3	44	0 38
12	9 57 13	50	13 21.9	44	0 35
13	9 58 3	50	13 17.5	45	0 32
14	9 58 53	51	13 13.0	44	0 28
15	9 59 44	50	+13 8.6	45	0 25
16	10 0 34		+13 4.1		0 22

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m
Aug. 16	10 0 34	51	+13 4.1	44	0 22
17	10 1 25	50	12 59.7	45	0 19
18	10 2 15	51	12 55.2	45	0 16
19	10 3 6	50	12 50.7	45	0 13
20	10 3 56	50	12 46.2	45	0 10
21	10 4 46	51	+12 41.7	45	0 7
22	10 5 37	50	12 37.2	45	0 4
23	10 6 27	50	12 32.7	45	{0 1 / 23 57}
24	10 7 17	51	12 28.2	46	23 54
25	10 8 8	50	12 23.6	45	23 51
26	10 8 58	50	+12 19.1	46	23 48
27	10 9 48	50	12 14.5	45	23 45
28	10 10 38	50	12 10.0	46	23 42
29	10 11 28	50	12 5.4	45	23 39
30	10 12 18	50	12 0.9	46	23 36
31	10 13 8	50	+11 56.3	45	23 33
Sept. 1	10 13 58	50	11 51.8	46	23 30
2	10 14 48	50	11 47.2	46	23 26
3	10 15 38	49	11 42.6	46	23 23
4	10 16 27	50	11 38.0	45	23 20
5	10 17 17	49	+11 33.5	46	23 17
6	10 18 6	50	11 28.9	46	23 14
7	10 18 56	49	11 24.3	45	23 11
8	10 19 45	49	11 19.8	46	23 8
9	10 20 34	49	11 15.2	46	23 5
10	10 21 23	49	+11 10.6	46	23 2
11	10 22 12	49	11 6.0	45	22 58
12	10 23 1	49	11 1.5	46	22 55
13	10 23 50	49	10 56.9	45	22 52
14	10 24 39	48	10 52.4	46	22 49
15	10 25 27	49	+10 47.8	45	22 46
16	10 26 16	48	10 43.3	46	22 43
17	10 27 4	48	10 38.7	45	22 40
18	10 27 52	48	10 34.2	45	22 36
19	10 28 40	48	10 29.7	46	22 33
20	10 29 28	47	+10 25.1	45	22 30
21	10 30 15	48	10 20.6	45	22 27
22	10 31 3	47	10 16.1	45	22 24
23	10 31 50	47	10 11.6	45	22 21
24	10 32 37	47	10 7.1	44	22 18
25	10 33 24	47	+10 2.7	45	22 14
26	10 34 11	46	9 58.2	44	22 11
27	10 34 57	47	9 53.8	45	22 8
28	10 35 44	46	9 49.3	44	22 5
29	10 36 30	46	9 44.9	44	22 2
30	10 37 16	46	+ 9 40.5	44	21 59
Oct. 1	10 38 2		+ 9 36.1		21 56

Polar Semidiameter: July 1, 0″.25; Aug. 1, 0″.24; Sept. 1, 0″.24; Oct. 1, 0″.25; Nov. 1, 0″.26; Dec. 1, 0″.28; Dec. 32, 0″.31.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Oct. 1	10 38 2	45	+9 36.1	44	21 56	Nov. 16	11 7 58	30	+6 41.7	29	19 24
2	10 38 47	46	9 31.7	44	21 52	17	11 8 28	29	6 38.8	29	19 21
3	10 39 33	45	9 27.3	43	21 49	18	11 8 57	29	6 35.9	28	19 17
4	10 40 18	45	9 23.0	43	21 46	19	11 9 26	29	6 33.1	27	19 14
5	10 41 3	45	9 18.7	44	21 43	20	11 9 55	28	6 30.4	27	19 10
6	10 41 48	44	+9 14.3	43	21 40	21	11 10 23	28	+6 27.7	27	19 7
7	10 42 32	45	9 10.0	42	21 36	22	11 10 51	27	6 25.0	25	19 3
8	10 43 17	44	9 5.8	43	21 33	23	11 11 18	26	6 22.5	26	19 0
9	10 44 1	43	9 1.5	42	21 30	24	11 11 44	26	6 19.9	25	18 56
10	10 44 44	44	8 57.3	43	21 27	25	11 12 10	26	6 17.4	24	18 53
11	10 45 28	43	+8 53.0	41	21 24	26	11 12 36	25	+6 15.0	23	18 49
12	10 46 11	43	8 48.9	42	21 20	27	11 13 1	24	6 12.7	23	18 46
13	10 46 54	43	8 44.7	42	21 17	28	11 13 25	24	6 10.4	23	18 42
14	10 47 37	42	8 40.5	41	21 14	29	11 13 49	23	6 8.1	22	18 39
15	10 48 19	43	8 36.4	41	21 11	30	11 14 12	23	6 5.9	21	18 35
16	10 49 2	41	+8 32.3	41	21 7	Dec. 1	11 14 35	22	+6 3.8	21	18 32
17	10 49 43	42	8 28.2	40	21 4	2	11 14 57	22	6 1.7	20	18 28
18	10 50 25	41	8 24.2	40	21 1	3	11 15 19	21	5 59.7	19	18 24
19	10 51 6	41	8 20.2	40	20 58	4	11 15 40	20	5 57.8	19	18 21
20	10 51 47	41	8 16.2	40	20 54	5	11 16 0	20	5 55.9	18	18 17
21	10 52 28	40	+8 12.2	39	20 51	6	11 16 20	19	+5 54.1	18	18 14
22	10 53 8	40	8 8.3	39	20 48	7	11 16 39	19	5 52.3	17	18 10
23	10 53 48	40	8 4.4	39	20 45	8	11 16 58	18	5 50.6	16	18 6
24	10 54 28	39	8 0.5	38	20 41	9	11 17 16	17	5 49.0	15	18 3
25	10 55 7	39	7 56.7	38	20 38	10	11 17 33	17	5 47.5	15	17 59
26	10 55 46	39	+7 52.9	38	20 35	11	11 17 50	16	+5 46.0	14	17 56
27	10 56 25	38	7 49.1	38	20 31	12	11 18 6	16	5 44.6	14	17 52
28	10 57 3	38	7 45.3	37	20 28	13	11 18 22	15	5 43.2	12	17 48
29	10 57 41	38	7 41.6	36	20 25	14	11 18 37	14	5 42.0	13	17 44
30	10 58 19	37	7 38.0	37	20 22	15	11 18 51	13	5 40.7	11	17 41
31	10 58 56	37	+7 34.3	36	20 18	16	11 19 4	13	+5 39.6	11	17 37
Nov. 1	10 59 33	37	7 30.7	35	20 15	17	11 19 17	12	5 38.5	9	17 33
2	11 0 10	36	7 27.2	36	20 12	18	11 19 29	12	5 37.6	0	17 30
3	11 0 46	36	7 23.6	35	20 8	19	11 19 41	11	5 36.6	8	17 26
4	11 1 22	35	7 20.1	34	20 5	20	11 19 52	10	5 35.8	8	17 22
5	11 1 57	35	+7 16.7	34	20 2	21	11 20 2	9	+5 35.0	7	17 18
6	11 2 32	35	7 13.3	34	19 58	22	11 20 11	9	5 34.3	6	17 14
7	11 3 7	34	7 9.9	33	19 55	23	11 20 20	8	5 33.7	6	17 11
8	11 3 41	33	7 6.6	33	19 51	24	11 20 28	8	5 33.1	5	17 7
9	11 4 14	34	7 3.3	32	19 48	25	11 20 36	6	5 32.6	4	17 3
10	11 4 48	32	+7 0.1	32	19 45	26	11 20 42	7	+5 32.2	3	16 59
11	11 5 20	33	6 56.9	31	19 41	27	11 20 49	5	5 31.9	3	16 55
12	11 5 53	32	6 53.8	31	19 38	28	11 20 54	5	5 31.6	2	16 52
13	11 6 25	31	6 50.7	31	19 34	29	11 20 59	3	5 31.4	1	16 48
14	11 6 56	31	6 47.6	30	19 31	30	11 21 2	4	5 31.3	0	16 44
15	11 7 27	31	+6 44.6	29	19 28	31	11 21 6	2	+5 31.3	0	16 40
16	11 7 58		+6 41.7		19 24	32	11 21 8		+5 31.3		16 36

Hor. Parallax: July 1, 0′.02; Aug. 1, 0′.02; Sept. 1, 0′.02; Oct. 1, 0′.02; Nov. 1, 0′.02; Dec. 1, 0′.03; Dec. 32, 0′.03.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Jan. 1	10 54 54	3	+8 52.9	6	16 13	Feb. 16	10 46 11	18	+ 9 56.1	19	13 3
2	10 54 51	4	8 53.5	7	16 9	17	10 45 53	17	9 58.0	18	12 59
3	10 54 47	5	8 54.2	7	16 5	18	10 45 36	17	9 59.8	19	12 55
4	10 54 42	4	8 54.9	8	16 1	19	10 45 19	18	10 1.7	19	12 50
5	10 54 38	6	8 55.7	8	15 57	20	10 45 1	18	10 3.6	19	12 46
6	10 54 32	5	+8 56.5	8	15 53	21	10 44 43	18	+10 5.5	19	12 42
7	10 54 27	6	8 57.3	9	15 49	22	10 44 25	17	10 7.4	19	12 38
8	10 54 21	7	8 58.2	9	15 45	23	10 44 8	18	10 9.3	18	12 34
9	10 54 14	6	8 59.1	10	15 41	24	10 43 50	18	10 11.1	19	12 29
10	10 54 8	8	9 0.1	10	15 37	25	10 43 32	18	10 13.0	19	12 25
11	10 54 0	7	+9 1.1	10	15 32	26	10 43 14	18	+10 14.9	19	12 21
12	10 53 53	8	9 2.1	11	15 28	27	10 42 56	18	10 16.8	19	12 17
13	10 53 45	8	9 3.2	11	15 24	28	10 42 38	18	10 18.7	19	12 12
14	10 53 37	9	9 4.3	11	15 20	29	10 42 20	18	10 20.6	18	12 8
15	10 53 28	9	9 5.4	12	15 16	Mar. 1	10 42 2	18	10 22.4	19	12 4
16	10 53 19	9	+9 6.6	12	15 12	2	10 41 44	18	+10 24.3	18	12 0
17	10 53 10	10	9 7.8	12	15 8	3	10 41 26	18	10 26.1	19	11 56
18	10 53 0	10	9 9.0	13	15 4	4	10 41 8	18	10 28.0	18	11 51
19	10 52 50	11	9 10.3	13	15 0	5	10 40 50	18	10 29.8	18	11 47
20	10 52 39	11	9 11.6	13	14 56	6	10 40 32	18	10 31.6	18	11 43
21	10 52 28	11	+9 12.9	14	14 52	7	10 40 14	17	+10 33.4	18	11 39
22	10 52 17	11	9 14.3	14	14 48	8	10 39 57	18	10 35.2	18	11 34
23	10 52 6	12	9 15.7	14	14 43	9	10 39 39	17	10 37.0	18	11 30
24	10 51 54	12	9 17.1	15	14 39	10	10 39 22	18	10 38.8	17	11 26
25	10 51 42	12	9 18.6	15	14 35	11	10 39 4	17	10 40.5	18	11 22
26	10 51 30	13	+9 20.1	15	14 31	12	10 38 47	17	+10 42.3	17	11 18
27	10 51 17	13	9 21.6	15	14 27	13	10 38 30	17	10 44.0	17	11 13
28	10 51 4	13	9 23.1	16	14 23	14	10 38 13	17	10 45.7	16	11 9
29	10 50 51	14	9 24.7	16	14 19	15	10 37 56	17	10 47.3	17	11 5
30	10 50 37	14	9 26.3	16	14 14	16	10 37 39	17	10 49.0	16	11 1
31	10 50 23	14	+9 27.9	16	14 10	17	10 37 22	16	+10 50.6	16	10 56
Feb. 1	10 50 9	14	9 29.5	17	14 6	18	10 37 6	17	10 52.2	16	10 52
2	10 49 55	15	9 31.2	16	14 2	19	10 36 49	16	10 53.8	16	10 48
3	10 49 40	15	9 32.8	17	13 58	20	10 36 33	16	10 55.4	15	10 44
4	10 49 25	15	9 34.5	17	13 54	21	10 36 17	15	10 56.9	15	10 40
5	10 49 10	15	+9 36.2	18	13 49	22	10 36 2	16	+10 58.4	15	10 35
6	10 48 55	16	9 38.0	17	13 45	23	10 35 46	15	10 59.9	15	10 31
7	10 48 39	16	9 39.7	18	13 41	24	10 35 31	15	11 1.4	14	10 27
8	10 48 23	16	9 41.5	18	13 37	25	10 35 16	15	11 2.8	14	10 23
9	10 48 7	16	9 43.3	18	13 33	26	10 35 1	14	11 4.2	14	10 19
10	10 47 51	16	+9 45.1	18	13 28	27	10 34 47	15	+11 5.6	14	10 15
11	10 47 35	17	9 46.9	18	13 24	28	10 34 32	14	11 7.0	13	10 10
12	10 47 18	16	9 48.7	18	13 20	29	10 34 18	13	11 8.3	13	10 6
13	10 47 2	17	9 50.5	19	13 16	30	10 34 5	14	11 9.6	12	10 2
14	10 46 45	17	9 52.4	18	13 12	31	10 33 51	13	11 10.8	12	9 58
15	10 46 28	17	+9 54.2	19	13 7	Apr. 1	10 33 38	13	+11 12.0	12	9 54
16	10 46 11		+9 56.1		13 3	2	10 33 25		+11 13.2		9 50

Polar Semidiameter: Jan. 1, 0′.14; Feb. 1, 0′.15; Mar. 1, 0′.15; Apr. 1, 0′.15; May 1, 0′.14; June 1, 0′.13; July 1, 0′.13.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.		Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	
	h m s		° ′		h m			h m s		° ′		h m	
Apr. 1	10 33 38	13	+11 12.0	12	9 54		May 17	10 29 51	4	+11 28.5	5	6 49	
2	10 33 25	12	11 13.2	12	9 50		18	10 29 55	4	11 28.0	6	6 45	
3	10 33 13	12	11 14.4	11	9 46		19	10 29 59	5	11 27.4	6	6 42	
4	10 33 0	12	11 15.5	11	9 41		20	10 30 4	6	11 26.8	7	6 38	
5	10 32 48	11	11 16.6	11	9 37		21	10 30 10	5	11 26.1	7	6 34	
6	10 32 37	12	+11 17.7	10	9 33		22	10 30 15	6	+11 25.4	7	6 30	
7	10 32 25	11	11 18.7	10	9 29		23	10 30 21	7	11 24.7	8	6 26	
8	10 32 14	11	11 19.7	9	9 25		24	10 30 28	7	11 23.9	8	6 22	
9	10 32 3	10	11 20.6	10	9 21		25	10 30 35	7	11 23.1	8	6 18	
10	10 31 53	10	11 21.6	8	9 17		26	10 30 42	8	11 22.2	9	6 15	
11	10 31 43	10	+11 22.4	9	9 12		27	10 30 50	8	+11 21.3	9	6 11	
12	10 31 33	9	11 23.3	8	9 8		28	10 30 58	8	11 20.4	10	6 7	
13	10 31 24	9	11 24.1	8	9 4		29	10 31 6	9	11 19.4	10	6 3	
14	10 31 15	9	11 24.9	7	9 0		30	10 31 15	9	11 18.4	10	6 0	
15	10 31 6	8	11 25.6	7	8 56		31	10 31 24	9	11 17.4	11	5 56	
16	10 30 58	8	+11 26.3	7	8 52		June 1	10 31 33	10	+11 16.3	11	5 52	
17	10 30 50	8	11 27.0	6	8 48		2	10 31 43	10	11 15.2	11	5 48	
18	10 30 42	7	11 27.6	6	8 44		3	10 31 53	11	11 14.1	12	5 44	
19	10 30 35	7	11 28.2	5	8 40		4	10 32 4	11	11 12.9	12	5 41	
20	10 30 28	6	11 28.7	5	8 36		5	10 32 15	11	11 11.7	12	5 37	
21	10 30 22	7	+11 29.2	5	8 32		6	10 32 26	12	+11 10.5	13	5 33	
22	10 30 15	5	11 29.7	4	8 28		7	10 32 38	12	11 9.2	13	5 30	
23	10 30 10	6	11 30.1	4	8 24		8	10 32 50	12	11 7.9	13	5 26	
24	10 30 4	5	11 30.5	3	8 20		9	10 33 2	13	11 6.6	14	5 22	
25	10 29 59	4	11 30.8	3	8 16		10	10 33 15	13	11 5.2	14	5 18	
26	10 29 55	4	+11 31.1	3	8 12		11	10 33 28	13	+11 3.8	14	5 15	
27	10 29 51	4	11 31.4	2	8 8		12	10 33 41	13	11 2.4	15	5 11	
28	10 29 47	3	11 31.6	2	8 4		13	10 33 54	14	11 0.9	15	5 7	
29	10 29 44	3	11 31.8	2	8 0		14	10 34 8	15	10 59.4	15	5 3	
30	10 29 41	3	11 32.0	1	7 56		15	10 34 23	14	10 57.9	16	5 0	
May 1	10 29 38	2	+11 32.1	1	7 52		16	10 34 37	15	+10 56.3	16	4 56	
2	10 29 36	2	11 32.2	0	7 48		17	10 34 52	16	10 54.7	16	4 52	
3	10 29 34	1	11 32.2	0	7 44		18	10 35 8	15	10 53.1	16	4 49	
4	10 29 33	1	11 32.2	1	7 40		19	10 35 23	16	10 51.5	17	4 45	
5	10 29 32	1	11 32.1	0	7 36		20	10 35 39	16	10 49.8	17	4 41	
6	10 29 31	0	+11 32.1	2	7 32		21	10 35 55	17	+10 48.1	18	4 38	
7	10 29 31	0	11 31.9	1	7 28		22	10 36 12	16	10 46.3	17	4 34	
8	10 29 31	1	11 31.8	2	7 24		23	10 36 28	17	10 44.6	18	4 30	
9	10 29 32	1	11 31.6	3	7 20		24	10 36 45	18	10 42.8	18	4 27	
10	10 29 33	1	11 31.3	3	7 16		25	10 37 3	17	10 41.0	19	4 23	
11	10 29 34	2	+11 31.0	3	7 12		26	10 37 20	18	+10 39.1	19	4 19	
12	10 29 36	2	11 30.7	3	7 9		27	10 37 38	18	10 37.2	19	4 16	
13	10 29 38	3	11 30.4	4	7 5		28	10 37 56	19	10 35.3	19	4 12	
14	10 29 41	3	11 30.0	5	7 1		29	10 38 15	19	10 33.4	20	4 9	
15	10 29 44	3	11 29.5	4	6 57		30	10 38 34	19	10 31.4	19	4 5	
16	10 29 47	4	+11 29.1	6	6 53		July 1	10 38 53	19	+10 29.5	20	4 1	
17	10 29 51		+11 28.5		6 49		2	10 39 12		+10 27.5		3 58	

Hor. Parallax: Jan. 1, 0′.02; Feb. 1, 0′.02; Mar. 1, 0′.02; Apr. 1, 0′.02; May 1, 0′.02; June 1, 0′.02; July 1, 0′.01.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.		Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m			h m s		° ′		h m
July 1	10 38 53	19	+10 29.5	20	4 1		Aug. 16	10 57 9	27	+8 36.4	27	1 19
2	10 39 12	19	10 27.5	21	3 58		17	10 57 36	27	8 33.7	28	1 15
3	10 39 31	20	10 25.4	20	3 54		18	10 58 3	27	8 30.9	28	1 12
4	10 39 51	20	10 23.4	21	3 50		19	10 58 30	28	8 28.1	29	1 8
5	10 40 11	20	10 21.3	21	3 47		20	10 58 58	27	8 25.2	28	1 5
6	10 40 31	21	+10 19.2	22	3 43		21	10 59 25	28	+8 22.4	28	1 1
7	10 40 52	21	10 17.0	21	3 40		22	10 59 53	28	8 19.6	28	0 58
8	10 41 13	21	10 14.9	22	3 36		23	11 0 21	27	8 16.8	29	0 54
9	10 41 34	21	10 12.7	22	3 32		24	11 0 48	28	8 13.9	28	0 51
10	10 41 55	21	10 10.5	22	3 29		25	11 1 16	28	8 11.1	29	0 47
11	10 42 16	22	+10 8.3	23	3 25		26	11 1 44	28	+8 8.2	28	0 44
12	10 42 38	22	10 6.0	23	3 22		27	11 2 12	28	8 5.4	29	0 40
13	10 43 0	22	10 3.8	23	3 18		28	11 2 40	27	8 2.5	28	0 37
14	10 43 22	22	10 1.5	23	3 15		29	11 3 7	28	7 59.7	29	0 34
15	10 43 44	23	9 59.2	24	3 11		30	11 3 35	28	7 56.8	29	0 30
16	10 44 7	23	+ 9 56.8	23	3 8		31	11 4 3	28	+7 53.9	28	0 27
17	10 44 30	23	9 54.5	24	3 4		Sept. 1	11 4 31	28	7 51.1	29	0 23
18	10 44 53	23	9 52.1	24	3 0		2	11 4 59	29	7 48.2	29	0 20
19	10 45 16	23	9 49.7	24	2 57		3	11 5 28	28	7 45.3	29	0 16
20	10 45 39	24	9 47.3	24	2 53		4	11 5 56	28	7 42.4	28	0 13
21	10 46 3	23	+ 9 44.9	24	2 50		5	11 6 24	28	+7 39.6	29	0 9
22	10 46 26	24	9 42.5	25	2 46		6	11 6 52	28	7 36.7	29	0 6
23	10 46 50	24	9 40.0	25	2 43		7	11 7 20	28	7 33.8	28	{0 2 / 23 59}
24	10 47 14	25	9 37.5	25	2 39		8	11 7 48	28	7 31.0	29	23 55
25	10 47 39	24	9 35.0	25	2 36		9	11 8 16	28	7 28.1	29	23 52
26	10 48 3	25	+ 9 32.5	25	2 32		10	11 8 44	28	+7 25.2	29	23 48
27	10 48 28	24	9 30.0	26	2 29		11	11 9 12	28	7 22.3	28	23 45
28	10 48 52	25	9 27.4	25	2 25		12	11 9 40	29	7 19.5	29	23 42
29	10 49 17	25	9 24.9	26	2 22		13	11 10 9	28	7 16.6	29	23 38
30	10 49 42	26	9 22.3	26	2 18		14	11 10 37	28	7 13.7	28	23 34
31	10 50 8	25	+ 9 19.7	26	2 15		15	11 11 5	28	+7 10.9	29	23 31
Aug. 1	10 50 33	25	9 17.1	26	2 11		16	11 11 33	28	7 8.0	28	23 28
2	10 50 58	26	9 14.5	27	2 8		17	11 12 1	27	7 5.2	29	23 24
3	10 51 24	26	9 11.8	26	2 4		18	11 12 28	28	7 2.3	29	23 21
4	10 51 50	26	9 9.2	27	2 1		19	11 12 56	28	6 59.5	28	23 17
5	10 52 16	26	+ 9 6.5	27	1 57		20	11 13 24	28	+6 56.7	28	23 14
6	10 52 42	26	9 3.8	27	1 54		21	11 13 52	28	6 53.9	29	23 10
7	10 53 8	26	9 1.1	27	1 50		22	11 14 20	27	6 51.0	28	23 7
8	10 53 34	27	8 58.4	27	1 46		23	11 14 47	28	6 48.2	28	23 3
9	10 54 1	26	8 55.7	27	1 43		24	11 15 15	27	6 45.4	28	23 0
10	10 54 27	27	+ 8 53.0	27	1 40		25	11 15 42	28	+6 42.6	28	22 56
11	10 54 54	27	8 50.3	28	1 36		26	11 16 10	27	6 39.8	27	22 53
12	10 55 21	26	8 47.5	27	1 33		27	11 16 37	27	6 37.1	28	22 50
13	10 55 47	27	8 44.8	28	1 29		28	11 17 4	28	6 34.3	28	22 46
14	10 56 14	27	8 42.0	28	1 26		29	11 17 32	27	6 31.5	27	22 42
15	10 56 41	28	+ 8 39.2	28	1 22		30	11 17 59	27	+6 28.8	27	22 39
16	10 57 9		+ 8 36.4		1 19		Oct. 1	11 18 26		+6 26.1		22 36

Polar Semidiameter: July 1, 0′.13; Aug. 1, 0′.12; Sept. 1, 0′.12; Oct. 1, 0′.12; Nov. 1, 0′.12; Dec. 1, 0′.13; Dec. 32, 0′.14.

GREENWICH MEAN TIME.

Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.	Date.	Apparent Right Ascension. Noon.		Apparent Declination. Noon.		Transit, Meridian of Greenwich.
	h m s		° ′		h m		h m s		° ′		h m
Oct. 1	11 18 26	27	+6 26.1	28	22 36	Nov. 16	11 36 19	18	+4 40.1	17	19 52
2	11 18 53	26	6 23.3	27	22 32	17	11 36 37	18	4 38.4	16	19 49
3	11 19 19	27	6 20.6	27	22 28	18	11 36 55	17	4 36.8	17	19 45
4	11 19 46	27	6 17.9	27	22 25	19	11 37 12	17	4 35.1	15	19 41
5	11 20 13	26	6 15.2	26	22 22	20	11 37 29	17	4 33.6	16	19 38
6	11 20 39	27	+6 12.6	27	22 18	21	11 37 46	17	+4 32.0	15	19 34
7	11 21 6	26	6 9.9	26	22 14	22	11 38 3	16	4 30.5	15	19 30
8	11 21 32	26	6 7.3	27	22 11	23	11 38 19	16	4 29.0	15	19 27
9	11 21 58	26	6 4.6	26	22 8	24	11 38 35	15	4 27.5	14	19 23
10	11 22 24	26	6 2.0	26	22 4	25	11 38 50	16	4 26.1	14	19 19
11	11 22 50	26	+5 59.4	26	22 0	26	11 39 6	15	+4 24.7	13	19 16
12	11 23 16	25	5 56.8	26	21 57	27	11 39 21	14	4 23.4	13	19 12
13	11 23 41	26	5 54.2	25	21 54	28	11 39 35	15	4 22.1	13	19 8
14	11 24 7	25	5 51.7	25	21 50	29	11 39 50	14	4 20.8	12	19 5
15	11 24 32	25	5 49.2	26	21 46	30	11 40 4	13	4 19.6	12	19 1
16	11 24 57	26	+5 46.6	25	21 43	Dec. 1	11 40 17	14	+4 18.4	12	18 57
17	11 25 22	25	5 44.1	24	21 40	2	11 40 31	13	4 17.2	11	18 54
18	11 25 47	26	5 41.7	25	21 36	3	11 40 44	12	4 16.1	11	18 50
19	11 26 12	24	5 39.2	24	21 32	4	11 40 56	12	4 15.0	10	18 46
20	11 26 36	24	5 36.8	24	21 29	5	11 41 8	12	4 14.0	10	18 42
21	11 27 1	24	+5 34.4	24	21 25	6	11 41 20	12	+4 13.0	10	18 38
22	11 27 25	24	5 32.0	24	21 22	7	11 41 32	11	4 12.0	9	18 35
23	11 27 49	24	5 29.6	24	21 18	8	11 41 43	11	4 11.1	9	18 31
24	11 28 13	23	5 27.2	23	21 15	9	11 41 54	10	4 10.2	8	18 27
25	11 28 36	24	5 24.9	23	21 11	10	11 42 4	10	4 9.4	8	18 24
26	11 29 0	23	+5 22.6	23	21 8	11	11 42 14	10	+4 8.6	8	18 20
27	11 29 23	23	5 20.3	23	21 4	12	11 42 24	10	4 7.8	7	18 16
28	11 29 46	23	5 18.0	22	21 0	13	11 42 34	8	4 7.1	6	18 12
29	11 30 9	22	5 15.8	22	20 57	14	11 42 42	9	4 6.5	7	18 8
30	11 30 31	23	5 13.6	22	20 53	15	11 42 51	8	4 5.8	5	18 5
31	11 30 54	22	+5 11.4	22	20 50	16	11 42 59	8	+4 5.3	6	18 1
Nov. 1	11 31 16	22	5 9.2	21	20 46	17	11 43 7	7	4 4.7	5	17 57
2	11 31 38	21	5 7.1	21	20 43	18	11 43 14	7	4 4.2	4	17 53
3	11 31 59	22	5 5.0	21	20 39	19	11 43 21	7	4 3.8	5	17 49
4	11 32 21	21	5 2.9	21	20 36	20	11 43 28	6	4 3.3	3	17 46
5	11 32 42	21	+5 0.8	20	20 32	21	11 43 34	6	+4 3.0	4	17 42
6	11 33 3	21	4 58.8	20	20 28	22	11 43 40	6	4 2.6	2	17 38
7	11 33 24	20	4 56.8	20	20 25	23	11 43 46	5	4 2.4	3	17 34
8	11 33 44	21	4 54.8	19	20 21	24	11 43 51	4	4 2.1	2	17 30
9	11 34 5	20	4 52.9	19	20 18	25	11 43 55	5	4 1.9	1	17 26
10	11 34 25	19	+4 51.0	19	20 14	26	11 44 0	4	+4 1.8	1	17 22
11	11 34 44	20	4 49.1	19	20 10	27	11 44 4	3	4 1.7	1	17 19
12	11 35 4	19	4 47.2	18	20 7	28	11 44 7	3	4 1.6	0	17 15
13	11 35 23	19	4 45.4	18	20 3	29	11 44 10	3	4 1.6	0	17 11
14	11 35 42	18	4 43.6	18	20 0	30	11 44 13	2	4 1.6	0	17 7
15	11 36 0	19	+4 41.8	17	19 56	31	11 44 15	2	+4 1.6	1	17 3
16	11 36 19		+4 40.1		19 52	32	11 44 17		+4 1.7		16 59

Hor. Parallax: July 1, 0′.01; Aug. 1, 0′.01; Sept. 1, 0′.01; Oct. 1, 0′.01; Nov. 1, 0′.01; Dec. 1, 0′.02; Dec. 32, 0′,02.

FOR THE UPPER TRANSIT AT GREENWICH.

No.	Constellation Name.	Right Ascension.													
			Jan. 1.	Feb. 1.	Mar. 1.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.	Dec. 1.	Dec. 32.
		h m	s	s	s	s	s	s	s	s	s	s	s	s	s
1	α Androm.	0 4	15.8	15.4	15.2	15.3	15.8	16.7	17.7	18.6	19.3	19.5	19.4	19.1	18.7
2	β Cassiop.	0 4	55.2	54.3	53.8	53.9	54.7	56.0	57.5	58.9	59.9	60.2	60.0	59.3	58.3
3	β Ceti	0 39	35.2	34.8	34.5	34.5	34.9	35.6	36.5	37.5	38.2	38.5	38.5	38.3	37.9
4	δ Cassiop.	1 20	36.5	35.5	34.6	34.3	34.7	35.8	37.4	39.0	40.3	41.1	41.3	41.0	40.2
5	α Urs. Min.	1 31	85.6	52.8	25.6	10.6	15.8	38.4	70.1	104.8	134.6	153.6	158.2	146.2	119.2
6	α Eridani	1 34	44.8	43.8	42.9	42.4	42.5	43.3	44.5	45.9	47.1	47.9	48.0	47.5	46.6
7	α Arietis	2 2	41.2	40.8	40.3	40.1	40.2	40.8	41.7	42.7	43.6	44.2	44.5	44.6	44.3
8	θ Eridani	2 55	15.2	14.5	13.8	13.3	13.1	13.4	14.1	15.2	16.2	17.0	17.5	17.5	17.2
9	α Persei	3 18	39.0	38.4	37.7	37.0	36.9	37.3	38.3	39.6	40.9	42.0	42.8	43.2	43.0
10	α Tauri	4 31	21.9	21.7	21.2	20.7	20.4	20.6	21.1	21.9	22.8	23.7	24.4	24.9	25.1
11	β Orionis	5 10	43.6	43.4	43.0	42.4	42.1	42.0	42.4	43.1	43.9	44.7	45.5	46.0	46.3
12	α Aurigæ	5 10	49.8	49.5	48.9	48.1	47.6	47.6	48.2	49.2	50.4	51.6	52.7	53.5	53.8
13	γ Orionis	5 20	52.6	52.5	52.0	51.5	51.1	51.1	51.5	52.2	53.0	53.9	54.7	55.2	55.5
14	ε Orionis	5 32	11.4	11.3	10.8	10.3	9.9	9.8	10.2	10.8	11.6	12.5	13.3	13.9	14.2
15	α Orionis	5 50	52.7	52.6	52.3	51.7	51.3	51.2	51.5	52.1	52.9	53.8	54.6	55.3	55.7
16	α Argus	6 22	13.2	12.9	12.1	11.0	10.1	9.5	9.4	9.9	10.9	12.1	13.3	14.1	14.5
17	α Can. Maj.	6 41	39.4	39.5	39.1	38.5	38.0	37.7	37.8	38.3	39.0	39.8	40.7	41.4	41.9
18	ε Can. Maj.	6 55	31.2	31.2	30.8	30.1	29.5	29.1	29.1	29.5	30.2	31.1	32.0	32.8	33.3
19	α Can. Min.	7 35	9.1	9.3	9.1	8.6	8.2	7.9	7.9	8.2	8.8	9.6	10.5	11.3	12.0
20	β Gemin.	7 40	27.8	28.2	28.0	27.5	26.9	26.5	26.6	26.9	27.6	28.4	29.5	30.4	31.2
21	ε Argus	8 20	55.6	55.9	55.4	54.4	53.2	52.1	51.5	51.4	51.9	53.0	54.5	55.9	56.8
22	λ Argus	9 5	5.6	6.1	6.0	5.5	4.8	4.1	3.7	3.6	3.9	4.6	5.6	6.8	7.7
23	β Argus	9 12	23.7	24.4	24.1	22.8	21.2	19.5	18.2	17.5	17.8	19.0	21.0	23.0	24.6
24	α Hydræ	9 23	41.3	41.9	42.0	41.7	41.3	40.9	40.6	40.6	40.9	41.4	42.3	43.2	44.0
25	α Leonis	10 4	8.5	9.2	9.5	9.3	8.9	8.5	8.3	8.2	8.4	8.8	9.5	10.5	11.4
26	α Urs. Maj.	10 58	49.9	51.3	52.0	51.9	51.1	50.0	49.0	48.4	48.2	48.6	49.7	51.3	53.1
27	β Leonis	11 44	59.9	60.8	61.4	61.5	61.4	61.0	60.7	60.4	60.3	60.4	60.9	61.7	62.7
28	α Crucis	12 22	10.1	11.7	12.8	13.2	13.0	12.3	11.3	10.3	9.6	9.4	10.2	11.6	13.4
29	γ Crucis	12 26	44.7	46.1	47.0	47.4	47.3	46.7	46.0	45.2	44.6	44.5	45.1	46.3	47.9
30	β Crucis	12 43	3.7	5.3	6.4	6.9	6.9	6.4	5.6	4.7	4.0	3.7	4.3	5.5	7.2
31	ε Urs. Maj.	12 50	30.9	32.4	33.4	33.9	33.7	33.1	32.3	31.4	30.7	30.5	30.8	31.7	33.2
32	ζ Urs. Maj.	13 20	42.2	43.7	44.8	45.4	45.4	44.9	44.2	43.3	42.5	42.1	42.2	43.0	44.3
33	α Virginis	13 20	59.3	60.3	61.0	61.5	61.6	61.5	61.3	60.9	60.6	60.4	60.6	61.3	62.2
34	θ Centauri	14 1	58.8	59.9	60.9	61.5	61.9	61.9	61.6	61.1	60.6	60.3	60.4	61.0	62.1
35	α Boötis	14 12	0.8	1.8	2.6	3.2	3.5	3.5	3.2	2.8	2.3	2.0	2.0	2.5	3.3
36	α Centauri	14 34	10.4	12.2	13.7	14.8	15.4	15.4	14.9	13.9	12.9	12.1	12.1	12.8	14.3
37	β Urs. Min.	14 50	51.6	54.1	56.5	58.4	59.1	58.5	56.9	54.6	52.1	50.2	49.1	49.4	51.1
38	α Cor. Bor.	15 31	17.6	18.5	19.4	20.2	20.7	20.9	20.8	20.4	19.8	19.3	19.0	19.2	19.9
39	δ Scorpii	15 55	36.0	37.0	37.9	38.8	39.4	39.8	39.8	39.6	39.1	38.6	38.4	38.6	39.2
40	α Scorpii	16 24	29.8	30.8	31.7	32.7	33.4	33.9	34.0	33.8	33.3	32.8	32.5	32.6	33.2
41	α Tri. Aust.	16 40	9.6	11.7	13.9	16.1	17.9	19.0	19.2	18.4	17.0	15.5	14.4	14.4	15.6
42	η Ophiuchi	17 5	47.0	47.8	48.7	49.6	50.4	50.9	51.2	51.1	50.6	50.1	49.7	49.7	50.2
43	λ Scorpii	17 28	10.0	10.9	11.9	13.0	14.0	14.8	15.1	15.0	14.5	13.9	13.4	13.3	13.8
44	α Ophiuchi	17 31	12.6	13.3	14.2	15.0	15.8	16.4	16.6	16.5	16.1	15.5	15.0	14.9	15.2
45	γ Draconis	17 54	43.1	43.8	44.8	46.1	47.1	47.8	48.0	47.7	46.9	45.8	44.9	44.3	44.4
46	ε Sagittarii	18 18	51.2	51.9	52.8	53.9	54.9	55.8	56.3	56.4	56.0	55.4	54.8	54.6	54.8
47	α Lyræ	18 34	12.7	13.2	13.9	15.0	15.9	16.7	17.1	17.0	16.5	15.8	15.0	14.5	14.6
48	σ Sagittarii	18 50	17.8	18.4	19.2	20.1	21.1	22.0	22.5	22.7	22.4	21.9	21.3	21.1	21.2
49	α Aquilæ	19 46	52.3	52.6	53.2	54.0	54.9	55.7	56.3	56.6	56.4	56.0	55.4	55.1	55.0
50	α Pavonis	20 19	18.3	18.7	19.5	20.8	22.3	23.8	25.0	25.6	25.5	24.7	23.7	22.9	22.6
51	α Cygni	20 38	41.4	41.4	41.9	42.7	43.8	44.9	45.7	46.1	46.0	45.4	44.6	43.9	43.3
52	ε Pegasi	21 40	15.3	15.3	15.5	16.1	16.9	17.8	18.6	19.2	19.4	19.2	18.8	18.3	18.0
53	α Gruis	22 3	11.3	11.1	11.4	12.1	13.1	14.3	15.5	16.4	16.7	16.5	15.9	15.2	14.6
54	α Pisc. Aust.	22 53	14.0	13.8	13.8	14.2	14.9	15.8	16.9	17.7	18.2	18.2	17.9	17.4	17.0
55	α Pegasi	23 0	46.8	46.6	46.6	46.9	47.5	48.5	49.4	50.2	50.6	50.6	50.4	50.0	49.6

FOR THE UPPER TRANSIT AT GREENWICH.

No.	Declination.													Special Name.	Mag.
		Jan. 1.	Feb. 1.	Mar. 1.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.	Dec. 1.	Dec. 32.	
	°	′	′	′	′	′	′	′	′	′	′	′	′	′	
1	+28	39.2	39.1	39.0	38.9	38.9	38.9	39.0	39.2	39.3	39.4	39.5	39.5	39.5	Alpheratz	2.2
2	+58	42.9	42.8	42.7	42.6	42.5	42.4	42.5	42.6	42.8	42.9	43.1	43.2	43.2	Caph	2.4
3	−18	25.6	25.6	25.6	25.5	25.4	25.3	25.2	25.1	25.1	25.1	25.2	25.2	25.3	Deneb Kaitos	2.2
4	+59	49.5	49.5	49.4	49.3	49.2	49.1	49.1	49.2	49.3	49.5	49.6	49.7	49.8	Ruchbah	2.8
5	+88	53.0	53.0	53.0	52.8	52.7	52.5	52.5	52.5	52.7	52.8	53.0	53.2	53.3	Polaris	2.1
6	−57	38.8	38.8	38.7	38.6	38.4	38.2	38.1	38.0	38.1	38.2	38.3	38.5	38.6	Achernar	0.6
7	+23	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.2	5.3	5.4	5.4	5.5	5.5	Hamal	2.2
8	−40	37.7	37.7	37.7	37.6	37.5	37.3	37.2	37.1	37.1	37.1	37.2	37.4	37.5	Acamar	3.0
9	+49	34.8	34.8	34.8	34.7	34.7	34.6	34.5	34.6	34.6	34.7	34.8	34.9	35.0		1.9
10	+16	20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.0	21.0	21.0	21.0	21.0	21.0	Aldebaran	1.1
11	− 8	17.7	17.7	17.8	17.8	17.8	17.7	17.6	17.5	17.5	17.5	17.5	17.6	17.7	Rigel	0.3
12	+45	55.1	55.1	55.2	55.1	55.1	55.0	54.9	54.9	54.9	54.9	55.0	55.0	55.1	Capella	0.2
13	+ 6	16.6	16.5	16.5	16.5	16.5	16.6	16.6	16.7	16.7	16.7	16.7	16.7	16.6	Bellatrix	1.7
14	− 1	15.2	15.3	15.3	15.3	15.3	15.3	15.2	15.1	15.1	15.1	15.1	15.2	15.2	Alnitam	1.8
15	+ 7	23.5	23.4	23.4	23.4	23.4	23.5	23.5	23.6	23.6	23.6	23.6	23.5	23.5	Betelgeux	1.0–1.4
16	−52	39.2	39.4	39.5	39.5	39.5	39.4	39.2	39.0	38.9	38.9	39.0	39.1	39.3	Canopus	−0.9
17	−16	36.5	36.6	36.7	36.7	36.7	36.6	36.5	36.4	36.3	36.3	36.4	36.5	36.6	Sirius	−1.6
18	−28	51.9	52.0	52.1	52.1	52.1	52.0	51.9	51.8	51.7	51.7	51.7	51.8	52.0	Adhara	1.6
19	+ 5	25.7	25.6	25.6	25.6	25.6	25.6	25.7	25.7	25.7	25.7	25.7	25.6	25.5	Procyon	0.5
20	+28	13.0	13.0	13.1	13.1	13.1	13.1	13.1	13.1	13.0	13.0	12.9	12.9	12.9	Pollux	1.2
21	−59	15.1	15.3	15.5	15.6	15.6	15.6	15.5	15.3	15.2	15.1	15.1	15.2	15.3		1.7
22	−43	6.6	6.7	6.9	7.0	7.0	7.0	6.9	6.8	6.7	6.6	6.6	6.7	6.8		2.2
23	−69	23.2	23.4	23.6	23.7	23.8	23.8	23.7	23.6	23.4	23.3	23.2	23.3	23.5	Miaplacidus	1.8
24	− 8	18.8	18.9	19.0	19.0	19.0	19.0	19.0	18.9	18.8	18.8	18.9	18.9	19.1	Alphard	2.2
25	+12	21.3	21.2	21.2	21.2	21.3	21.3	21.3	21.3	21.3	21.3	21.2	21.1	21.0	Regulus	1.3
26	+62	10.6	10.6	10.7	10.9	11.0	11.0	11.0	10.9	10.8	10.6	10.4	10.3	10.3	Dubhe	2.0
27	+15	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	·1.0	0.9	0.9	0.7	0.6	Denebola	2.2
28	−62	39.2	39.3	39.5	39.6	39.8	39.9	39.9	39.9	39.7	39.6	39.5	39.4	39.5	Acrux	1.1
29	−56	39.7	39.9	40.0	40.2	40.3	40.4	40.4	40.4	40.3	40.2	40.0	40.0	40.0		1.6
30	−59	14.9	15.0	15.2	15.3	15.5	15.6	15.6	15.6	15.5	15.3	15.2	15.2	15.2		1.5
31	+56	23.3	23.2	23.3	23.4	23.6	23.7	23.7	23.7	23.6	23.4	23.2	23.1	23.0	Alioth	1.7
32	+55	20.2	20.2	20.2	20.3	20.5	20.6	20.7	20.7	20.6	20.4	20.3	20.1	19.9	Mizar	2.2
33	−10	44.7	44.8	44.8	44.9	44.9	44.9	44.9	44.8	44.8	44.8	44.8	44.9	44.9	Spica	1.2
34	−35	58.5	58.6	58.7	58.7	58.9	58.9	58.9	58.9	58.9	58.8	58.7	58.7	58.7		2.3
35	+19	35.7	35.6	35.6	35.6	35.7	35.8	35.9	35.9	35.9	35.8	35.7	35.6	35.5	Arcturus	0.2
36	−60	30.0	30.1	30.2	30.3	30.4	30.6	30.6	30.7	30.6	30.5	30.4	30.3	30.2	Rigil Kentaurus	0.1
37	+74	28.7	28.6	28.6	28.7	28.9	29.0	29.1	29.2	29.1	29.0	28.9	28.6	28.5	Kochab	2.2
38	+26	58.9	58.8	58.7	58.7	58.8	59.0	59.1	59.1	59.1	59.1	59.0	58.9	58.7	Alphecca	2.3
39	−22	23.6	23.7	23.7	23.8	23.8	23.8	23.8	23.8	23.8	23.7	23.7	23.7	23.7	Dschubba	2.5
40	−26	15.2	15.3	15.3	15.3	15.4	15.4	15.4	15.4	15.4	15.4	15.3	15.3	15.3	Antares	1.2
41	−68	52.8	52.7	52.7	52.7	52.8	53.0	53.1	53.2	53.2	53.2	53.1	52.9	52.8		1.9
42	−15	37.5	37.6	37.6	37.6	37.6	37.6	37.6	37.6	37.5	37.5	37.5	37.5	37.6	Sabik	2.6
43	−37	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.8	2.7	2.7	Shaula	1.7
44	+12	37.1	37.0	36.9	36.9	37.0	37.1	37.2	37.2	37.3	37.3	37.3	37.2	37.1	Rasalhague	2.1
45	+51	29.9	29.7	29.6	29.6	29.7	29.9	30.0	30.2	30.3	30.3	30.2	30.1	29.9	Etamin	2.4
46	−34	25.3	25.3	25.3	25.2	25.2	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	Kaus Australis	2.0
47	+38	42.6	42.4	42.3	42.3	42.4	42.5	42.7	42.8	42.9	43.0	42.9	42.8	42.7	Vega	0.1
48	−26	23.8	23.7	23.7	23.7	23.7	23.6	23.6	23.7	23.7	23.7	23.7	23.7	23.7	Nunki	2.1
49	+ 8	39.5	39.4	39.4	39.4	39.4	39.5	39.6	39.7	39.8	39.8	39.8	39.7	39.7	Altair	0.9
50	−56	59.6	59.4	59.3	59.2	59.1	59.1	59.2	59.3	59.4	59.4	59.5	59.5	59.4		2.1
51	+44	59.9	59.7	59.6	59.5	59.5	59.6	59.8	59.9	60.1	60.2	60.2	60.2	60.1	Deneb	1.3
52	+ 9	30.6	30.5	30.5	30.5	30.6	30.6	30.7	30.8	30.9	30.9	31.0	30.9	30.9	Enif	2.5
53	−47	21.0	20.9	20.8	20.7	20.6	20.5	20.5	20.5	20.6	20.7	20.8	20.8	20.7		2.2
54	−30	2.8	2.8	2.7	2.6	2.5	2.4	2.3	2.3	2.3	2.4	2.5	2.5	2.6	Fomalhaut	1.3
55	+14	46.6	46.6	46.5	46.5	46.5	46.6	46.7	46.8	46.9	47.0	47.0	47.0	46.9	Markab	2.6

GREENWICH MEAN TIME OF TRANSIT AT GREENWICH.

Constellation Name.	Mag.	Jan. 1.	Feb. 1.	Mar. 1.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.	Sept. 1.	Oct. 1.	Nov. 1.	Dec. 1.
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
α Androm.	2.2	5 24	3 22	1 28	23 22	21 24	19 22	17 25	15 23	13 21	11 23	9 21	7 23
β Cassiop.	2.4	5 25	3 23	1 29	23 23	21 25	19 23	17 25	15 23	13 21	11 23	9 22	7 24
β Ceti	2.2	5 59	3 57	2 3	{0 1 / 23 57}	22 0	19 58	18 0	15 58	13 56	11 58	9 56	7 58
δ Cassiop.	2.8	6 40	4 38	2 44	0 42	22 40	20 39	18 41	16 39	14 37	12 39	10 37	8 39
α Urs. Min.	2.1	6 52	4 49	2 55	0 53	22 51	20 50	18 52	16 51	14 49	12 52	10 50	8 52
α Eridani	0.6	6 54	4 52	2 58	0 56	22 54	20 53	18 55	16 53	14 51	12 53	10 51	8 53
α Arietis	2.2	7 22	5 20	3 26	1 24	23 22	21 21	19 23	17 21	15 19	13 21	11 19	9 21
θ Eridani	3.0	8 15	6 13	4 19	2 17	0 19	22 13	20 15	18 13	16 11	14 13	12 11	10 13
α Persei	1.9	8 38	6 36	4 42	2 40	0 42	22 36	20 38	18 37	16 35	14 37	12 35	10 37
α Tauri	1.1	9 50	7 49	5 55	3 53	1 55	23 49	21 51	19 49	17 47	15 49	13 47	11 49
β Orionis	0.3	10 30	8 28	6 34	4 32	2 34	0 32	22 30	20 28	18 26	16 28	14 27	12 29
α Aurigæ	0.2	10 30	8 28	6 34	4 32	2 34	0 32	22 30	20 28	18 27	16 29	14 27	12 29
γ Orionis	1.7	10 40	8 38	6 44	4 42	2 44	0 42	22 40	20 38	18 36	16 38	14 37	12 39
ε Orionis	1.8	10 51	8 49	6 55	4 53	2 55	0 53	22 52	20 50	18 48	16 50	14 48	12 50
α Orionis	1.0–1.4	11 10	9 8	7 14	5 12	3 14	1 12	23 10	21 8	19 6	17 8	15 7	13 9
α Argus	−0.9	11 41	9 39	7 45	5 43	3 45	1 43	23 41	21 39	19 38	17 40	15 38	13 40
α Can. Maj.	−1.6	12 0	9 58	8 4	6 3	4 5	2 3	0 5	21 59	19 57	17 59	15 57	13 59
ε Can. Maj.	1.6	12 14	10 12	8 18	6 16	4 18	2 16	0 18	22 13	20 11	18 13	16 11	14 13
α Can. Min.	0.5	12 54	10 52	8 58	6 56	4 58	2 56	0 58	22 52	20 50	18 52	16 51	14 53
β Gemin.	1.2	12 59	10 57	9 3	7 1	5 3	3 1	1 3	22 58	20 56	18 58	16 56	14 58
ε Argus	1.7	13 39	11 37	9 43	7 41	5 43	3 42	1 44	23 38	21 36	19 38	17 36	15 38
λ Argus	2.2	14 23	12 22	10 27	8 26	6 27	4 26	2 28	0 26	22 20	20 22	18 20	16 22
β Argus	1.8	14 31	12 29	10 35	8 33	6 35	4 33	2 35	0 33	22 27	20 29	18 27	16 29
α Hydræ	2.2	14 42	12 40	10 46	8 44	6 46	4 44	2 46	0 44	22 39	20 41	18 39	16 41
α Leonis	1.3	15 22	13 20	11 26	9 24	7 26	5 25	3 27	1 25	23 19	21 21	19 19	17 21
α Urs. Maj.	2.0	16 17	14 15	12 21	10 19	8 21	6 19	4 21	2 19	0 17	22 16	20 14	18 16
β Leonis	2.2	17 3	15 1	13 7	11 5	9 7	7 5	5 7	3 5	1 3	23 2	21 0	19 2
α Crucis	1.1	17 40	15 38	13 44	11 42	9 44	7 42	5 44	3 42	1 40	23 39	21 37	19 39
γ Crucis	1.6	17 44	15 43	13 49	11 47	9 49	7 47	5 49	3 47	1 45	23 43	21 41	19 43
β Crucis	1.5	18 1	15 59	14 5	12 3	10 5	8 3	6 5	4 3	2 1	{0 3 / 23 59}	21 58	20 0
ε Urs. Maj.	1.7	18 8	16 6	14 12	12 10	10 12	8 11	6 13	4 11	2 9	0 11	22 5	20 7
ζ Urs. Maj.	2.2	18 38	16 36	14 42	12 40	10 42	8 41	6 43	4 41	2 39	0 41	22 35	20 37
α Virginis	1.2	18 39	16 37	14 43	12 41	10 43	8 41	6 43	4 41	2 39	0 41	22 35	20 37
θ Centauri	2.3	19 19	17 18	15 24	13 22	11 24	9 22	7 24	5 22	3 20	1 22	23 16	21 18
α Boötis	0.2	19 29	17 28	15 34	13 32	11 34	9 32	7 34	5 32	3 30	1 32	23 26	21 28
α Centauri	0.1	19 51	17 50	15 56	13 54	11 56	9 54	7 56	5 54	3 52	1 54	23 48	21 50
β Urs. Min.	2.2	20 8	18 7	16 12	14 10	12 12	10 11	8 13	6 11	4 9	2 11	0 9	22 7
α Cor. Bor.	2.3	20 49	18 47	16 53	14 51	12 53	10 51	8 53	6 51	4 49	2 51	0 49	22 47
δ Scorpii	2.5	21 13	19 11	17 17	15 15	13 17	11 15	9 17	7 15	5 13	3 16	1 14	23 12
α Scorpii	1.2	21 42	19 40	17 46	15 44	13 46	11 44	9 46	7 44	5 42	3 44	1 42	23 41
α Tri. Aust.	1.9	21 57	19 55	18 1	16 0	14 2	12 0	10 2	8 0	5 58	4 0	1 58	{0 0 / 23 56}
η Ophiuchi	2.6	22 23	20 21	18 27	16 25	14 27	12 25	10 27	8 25	6 23	4 26	2 24	0 26
λ Scorpii	1.7	22 45	20 43	18 49	16 47	14 49	12 47	10 49	8 48	6 46	4 48	2 46	0 48
α Ophiuchi	2.1	22 48	20 46	18 52	16 50	14 52	12 51	10 53	8 51	6 49	4 51	2 49	0 51
γ Draconis	2.4	23 12	21 10	19 16	17 14	15 16	13 14	11 16	9 14	7 12	5 14	3 12	1 14
ε Sagittarii	2.0	23 36	21 34	19 40	17 38	15 40	13 38	11 40	9 38	7 36	5 38	3 36	1 38
α Lyræ	0.1	23 51	21 49	19 55	17 53	15 55	13 53	11 55	9 54	7 52	5 54	3 52	1 54
σ Sagittarii	2.1	0 11	22 5	20 11	18 9	16 11	14 9	12 11	10 10	8 8	6 10	4 8	2 10
α Aquilæ	0.9	1 7	23 2	21 8	19 6	17 8	15 6	13 8	11 6	9 4	7 6	5 4	3 6
α Pavonis	2.1	1 40	23 34	21 40	19 38	17 40	15 38	13 40	11 38	9 37	7 39	5 37	3 39
α Cygni	1.3	1 59	23 53	21 59	19 57	17 59	15 57	13 59	11 58	9 56	7 58	5 56	3 58
ε Pegasi	2.5	3 0	0 58	23 1	20 59	19 1	16 59	15 1	12 59	10 57	8 59	6 57	4 59
α Gruis	2.2	3 23	1 21	23 23	21 22	19 24	17 22	15 24	13 22	11 20	9 22	7 20	5 22
α Pisc. Aust.	1.3	4 13	2 11	0 17	22 11	20 13	18 12	16 14	14 12	12 10	10 12	8 10	6 12
α Pegasi	2.6	4 21	2 19	0 25	22 19	20 21	18 19	16 21	14 19	12 17	10 19	8 18	6 20

CORRECTIONS TO BE APPLIED TO THE MEAN TIME OF TRANSIT ON THE FIRST DAY OF THE MONTH, TO FIND THE MEAN TIME OF TRANSIT ON ANY OTHER DAY OF THE MONTH.

Day of Month.	Correction.	Day of Month.	Correction.	Day of Month.	Correction.
	h m		h m		h m
1	0 0	11	−0 39	21	−1 19
2	−0 4	12	0 43	22	1 23
3	0 8	13	0 47	23	1 27
4	0 12	14	0 51	24	1 30
5	0 16	15	0 55	25	1 34
6	−0 20	16	−0 59	26	−1 38
7	0 24	17	1 3	27	1 42
8	0 28	18	1 7	28	1 46
9	0 31	19	1 11	29	1 50
10	0 35	20	1 15	30	1 54
11	−0 39	21	−1 19	31	−1 58

NOTE.—If the quantity taken from this table is greater than the mean time of transit on the first of the month, increase that time by $23^h\ 56^m$ and then apply the correction taken from this Table.

FOR JANUARY 1d.157, GREENWICH MEAN TIME.

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
γ Pegasi	2.9	0 9 6.9	+3.09	+14 44 20	+20.0
β Hydri	2.9	0 21 34.2	3.19	−77 42 17	20.3
α Phœnicis	2.4	0 22 20.0	2.97	−42 44 26	19.5
α Cassiop. (*Schedir*) (*var.*)	2.5	0 35 57.4	3.39	+56 5 56	19.8
γ Cassiopeiæ	2.2	0 51 52.0	3.60	+60 17 2	19.5
β Andromedæ	2.4	1 5 14.8	+3.35	+35 11 48	+19.1
β Arietis	2.7	1 50 13.0	3.31	+20 25 3	17.7
α Hydri	3.0	1 56 14.5	1.88	−61 57 32	17.5
γ Andromedæ *pr.*	2.3	1 58 58.9	3.67	+41 56 48	17.4
β Trianguli	3.1	2 4 46.7	3.56	+34 36 34	17.1
α Ceti	2.8	2 58 5.7	+3.13	+ 3 46 36	+14.2
γ Persei	3.1	2 58 59.5	4.33	+53 11 39	14.2
β Persei (*Algol*) (*var.*)	2.6	3 2 57.4	3.90	+40 38 54	14.0
η Tauri (*Alcyone*)	3.0	3 42 43.5	+3.56	+23 51 31	11.3
γ Hydri	3.2	3 48 27.6	−0.96	−74 29 4	11.0
ζ Persei	2.9	3 49 5.9	+3.77	+31 38 50	+10.8
ε Persei	3.0	3 52 28.8	4.02	+39 46 48	10.6
γ Eridani	3.2	3 54 17.8	2.80	−13 44 7	10.3
ι Aurigæ	2.9	4 51 46.9	3.90	+33 2 26	5.9
β Eridani	2.9	5 3 55.0	2.95	− 5 11 20	4.8
β Tauri	1.8	5 21 14.0	+3.79	+28 32 28	+ 3.2
δ Orionis	2.5	5 27 55.1	3.06	− 0 21 26	2.8
α Leporis	2.7	5 29 12.1	2.65	−17 52 43	2.7
ζ Tauri	3.0	5 32 51.8	3.59	+21 5 41	2.3
ζ Orionis	2.0	5 36 43.3	3.03	− 1 59 2	2.0
α Columbæ	2.8	5 36 45.1	+2.17	−34 6 58	+ 2.0
κ Orionis	2.2	5 43 57.7	2.84	− 9 41 49	1.4
β Aurigæ	2.1	5 53 39.7	4.40	+44 56 27	0.5
θ Aurigæ	2.7	5 54 16.0	4.09	+37 12 30	+ 0.4
β Canis Majoris	2.0	6 19 10.6	2.64	−17 54 55	− 1.7
γ Geminorum	1.9	6 33 5.5	+3.47	+16 28 7	− 2.9
τ Argus	2.8	6 47 57.0	1.49	−50 31 9	4.3
δ Canis Majoris	2.0	7 5 8.2	2.44	−26 15 55	5.6
π Argus	2.7	7 14 19.0	2.12	−36 57 12	6.4
η Canis Majoris	2.4	7 20 55.9	2.37	−29 8 46	6.9
β Canis Minoris	3.1	7 22 48.8	+3.26	+ 8 27 6	− 7.1
α^2 Geminorum (*Castor*)	2.0	7 29 29.9	3.83	+32 3 56	7.7
ζ Argus	2.3	8 0 46.3	2.11	−39 46 38	10.1
ρ Argus	2.9	8 4 8.2	2.55	−24 4 22	10.3
γ Argus	2.2	8 7 4.1	1.85	−47 6 1	10.6
δ Argus	2.0	8 42 29.5	+1.65	−54 24 54	−13.2
ι Ursæ Majoris	3.1	8 53 44.3	4.12	+48 21 24	14.0
ι Argus	2.2	9 14 56.8	1.60	−58 56 21	15.1
κ Argus	2.6	9 19 38.1	1.86	−54 40 8	15.4
ε Leonis	3.1	9 41 18.8	3.41	+24 8 36	16.5
γ Leonis *pr.*	2.6	10 15 33.9	+3.31	+20 14 48	−18.2
μ Ursæ Majoris	3.2	10 17 34.2	3.58	+41 54 9	18.0
θ Argus	3.0	10 40 5.9	2.13	−63 58 32	18.9
μ Argus	2.8	10 43 19.5	2.57	−48 59 51	19.0
β Ursæ Majoris	2.4	10 57 1.5	3.64	+56 48 42	19.3
ψ Ursæ Majoris	3.2	11 5 10.4	+3.38	+44 55 58	−19.5
δ Leonis	2.6	11 9 51.4	3.19	+20 57 44	19.7
γ Ursæ Majoris	2.5	11 49 37.9	3.17	+54 8 22	20.0
δ Centauri	2.9	12 4 12.3	3.10	−50 16 37	20.1
δ Crucis	3.1	12 10 53.6	+3.18	−58 18 16	−20.1

FOR JANUARY 1d.157, GREENWICH MEAN TIME.

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
γ Corvi	2.8	12 11 41.4	+3.08	−17 5 52	−20.0
β Corvi	2.8	12 30 10.8	3.15	−22 57 16	19.9
α Muscæ	2.9	12 32 23.7	3.55	−68 41 42	19.9
γ Centauri	2.4	12 37 5.8	3.30	−48 31 14	19.8
α Canum. Venat. *seq.*	2.9	12 52 17.3	2.81	+38 45 1	19.5
ε Virginis	3.0	12 58 11.7	+2.99	+11 23 20	−19.4
ι Centauri	2.9	13 16 5.6	3.36	−36 17 27	19.0
ε Centauri	2.6	13 34 48.5	3.78	−53 3 37	18.4
η Ursæ Majoris (*Alkaid*)	1.9	13 44 23.4	2.37	+49 42 43	18.0
η Boötis	2.8	13 50 52.5	2.86	+18 47 54	18.1
β Centauri	0.9	13 58 9.9	+4.21	−59 59 16	−17.5
γ Boötis	3.0	14 28 51.5	2.42	+38 39 27	15.8
η Centauri	2.6	14 30 25.2	3.80	−41 48 26	15.9
ε Boötis	2.7	14 41 29.6	2.62	+27 24 39	15.3
α Libræ	2.9	14 46 27.0	3.31	−15 42 36	15.1
γ Trianguli Australis	3.1	15 11 25.0	+5.56	−68 23 8	−13.5
β Libræ	2.7	15 12 42.0	+3.23	− 9 5 19	13.4
γ Ursæ Minoris	3.1	15 20 50.7	−0.11	+72 7 7	12.8
γ Lupi (*mean*)	3.0	15 29 48.2	+3.99	−40 53 57	12.3
α Serpentis	2.8	15 40 19.6	2.95	+ 6 40 35	11.4
β Trianguli Australis	3.0	15 48 4.8	+5.26	−63 11 7	−11.3
π Scorpii	3.0	15 54 0.5	3.62	−25 53 6	10.5
β Scorpii	2.9	16 0 46.9	3.48	−19 35 15	10.0
δ Ophiuchi	3.0	16 10 9.1	3.14	− 3 29 21	9.4
η Draconis	2.9	16 22 54.3	0.81	+61 41 42	8.2
β Herculis	2.8	16 26 46.8	+2.58	+21 39 47	− 8.0
ζ Ophiuchi	2.7	16 32 45.1	3.30	−10 24 22	7.4
ζ Herculis	3.0	16 38 16.2	2.26	+31 44 49	6.6
ε Scorpii	2.4	16 44 58.7	3.88	−34 8 58	6.7
δ Herculis	3.2	17 11 44.7	2.46	+24 55 58	4.3
β Aræ	2.8	17 18 38.8	+4.98	−55 27 21	− 3.6
α Aræ	3.0	17 25 39.3	4.63	−49 48 51	3.1
β Draconis	3.0	17 28 37.5	1.35	+52 21 36	2.7
θ Scorpii	2.0	17 31 34.0	4.31	−42 56 54	2.5
β Ophiuchi	2.9	17 39 31.2	2.96	+ 4 35 59	− 1.6
δ Sagittarii	2.8	18 15 52.3	+3.84	−29 51 48	+ 1.4
ζ Sagittarii	2.7	18 57 31.3	3.82	−29 59 45	5.0
ζ Aquilæ	3.0	19 1 44.0	2.76	+13 44 37	5.2
π Sagittarii	3.0	19 5 0.4	3.57	−21 9 7	5.6
δ Draconis	3.2	19 12 32.5	0.02	+67 31 15	6.3
β Cygni	3.2	19 27 29.7	+2.42	+27 47 27	+ 7.5
δ Cygni	3.0	19 42 28.5	1.88	+44 56 5	8.7
β Capricorni	3.2	20 16 31.1	3.37	−15 2 6	11.3
γ Cygni	2.3	20 19 21.4	2.15	+40 0 0	11.5
α Indi	3.2	20 31 56.6	4.23	−47 34 18	12.4
ε Cygni	2.6	20 42 58.5	+2.43	+33 40 12	+13.4
α Cephei	2.6	21 16 40.3	1.43	+62 14 47	15.2
β Aquarii	3.1	21 27 20.9	3.16	− 5 55 26	15.8
δ Capricorni	3.0	21 42 37.6	3.31	−16 29 28	16.3
γ Gruis	3.2	21 49 5.3	3.64	−37 44 31	16.8
α Aquarii	3.2	22 1 40.5	+3.08	− 0 42 32	+17.4
α Tucanæ	2.9	22 13 1.9	4.13	−60 39 31	17.9
β Gruis	2.2	22 37 53.8	3.59	−47 18 13	18.7
η Pegasi	3.1	22 39 15.0	2.81	+29 48 8	18.8
β Pegasi (*var.*)	2.4	22 59 53.6	+2.91	+27 38 55	+19.5

In the year 1920 there will be four eclipses, two of the Sun and two of the Moon.

I.—*A Total Eclipse of the Moon*, May 2, 1920, visible at Washington; the beginning visible generally in Europe, western Asia, Africa, the Indian Ocean except the eastern portion, the Atlantic Ocean, eastern North America, and South America; the ending visible generally in western Europe, western Africa, the Atlantic Ocean, North America except the extreme northwestern portion, South America, and the eastern portion of the Pacific Ocean.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, May d 2 h 13 m 59 s 14.0

	h m s		s
Sun's right ascension	2 39 32.08	Hourly motion	9.58
Moon's right ascension	14 39 32.08	Hourly motion	123.88
	° ′ ″		′ ″
Sun's declination	+15 32 32.5	Hourly motion	+0 44.4
Moon's declination	−15 51 6.0	Hourly motion	−6 36.1
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 51.7
Moon's equa. hor. parallax	54 47.6	Moon's true semidiameter	14 55.1

CIRCUMSTANCES OF THE ECLIPSE.

	d h m	
Moon enters penumbra	May 2 10 49.3	Greenwich Mean Time.
Moon enters umbra	2 12 0.8	
Total eclipse begins	2 13 14.7	
Middle of the eclipse	2 13 50.9	
Total eclipse ends	2 14 27.1	
Moon leaves umbra	2 15 41.3	
Moon leaves penumbra	2 16 53.2	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,	and in Latitude.
	°	° ′	° ′
First	83 to E.	+ 1 56	−15 38
Last	59 to W.	+55 18	−16 2

Magnitude of the eclipse=1.224 (Moon's diameter=1.0).

II.—*A Partial Eclipse of the Sun*, May 17, 1920, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, May d 17 h 18 m 0 s 14.4

	h m s		s s
Sun and Moon's R. A.	3 38 44.17	Hourly motions	9.94 and 157.15
	° ′ ″		′ ″
Sun's declination	+19 29 22.0	Hourly motion	+0 33.2
Moon's declination	+18 26 31.5	Hourly motion	+5 19.0
Sun's equa. hor. parallax	8.7	Sun's true semidiameter	15 48.4
Moon's equa. hor. parallax	60 56.9	Moon's true semidiameter	16 35.6

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	° ′	° ′
Eclipse begins	May 17 16 16.9	− 46 28	−46 11
Greatest eclipse	17 18 14.7	−107 32	−69 5
Eclipse ends	17 20 12.6	−133 3	−32 7

Magnitude of greatest eclipse=0.973 (Sun's diameter=1.0).

III.—*A Total Eclipse of the Moon*, October 26–27, 1920, invisible at Washington; the beginning visible generally in western North America, the Pacific Ocean, Australia, Asia except the western portion, and the eastern portion of the Indian Ocean; the ending visible generally in the western portion of the Pacific Ocean, Asia, Australia, the Indian Ocean, eastern Africa, and Europe except the western portion.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☍ in right ascension, October 27 2h 18m 11.3s

Sun's right ascension	14h 6m 29.31s		Hourly motion		9.63s
Moon's right ascension	2h 6m 29.31s		Hourly motion		140.76s
Sun's declination	−12° 48′ 41.8″		Hourly motion		− 0′ 50.7″
Moon's declination	+13° 3′ 56.4″		Hourly motion		+ 8′ 52.8″
Sun's equa. hor. parallax		8.9	Sun's true semidiameter		16′ 6.0″
Moon's equa. hor. parallax		59′ 3.9″	Moon's true semidiameter		16′ 4.9″

CIRCUMSTANCES OF THE ECLIPSE.

Moon enters penumbra	Oct. 26 23h 24.5m	Greenwich Mean Time.
Moon enters umbra	27 0h 25.6m	
Total eclipse begins	27 1h 28.6m	
Middle of the eclipse	27 2h 11.4m	
Total eclipse ends	27 2h 54.3m	
Moon leaves umbra	27 3h 57.5m	
Moon leaves penumbra	27 4h 58.7m	

Contacts of Umbra with Moon's Limb.	Angles of Position from the North Point.	The Moon being in the Zenith in Longitude from Greenwich,	and in Latitude.
	°	° ′	° ′
First	90 to E.	−168 34	+12 47
Last	118 to W.	−117 30	+13 19

Magnitude of the eclipse=1.404 (Moon's diameter=1.0).

IV.—*A Partial Eclipse of the Sun*, November 10, 1920, visible at Washington.

ELEMENTS OF THE ECLIPSE.

Greenwich mean time of ☌ in right ascension, Nov. 10 3h 27m 48.1s

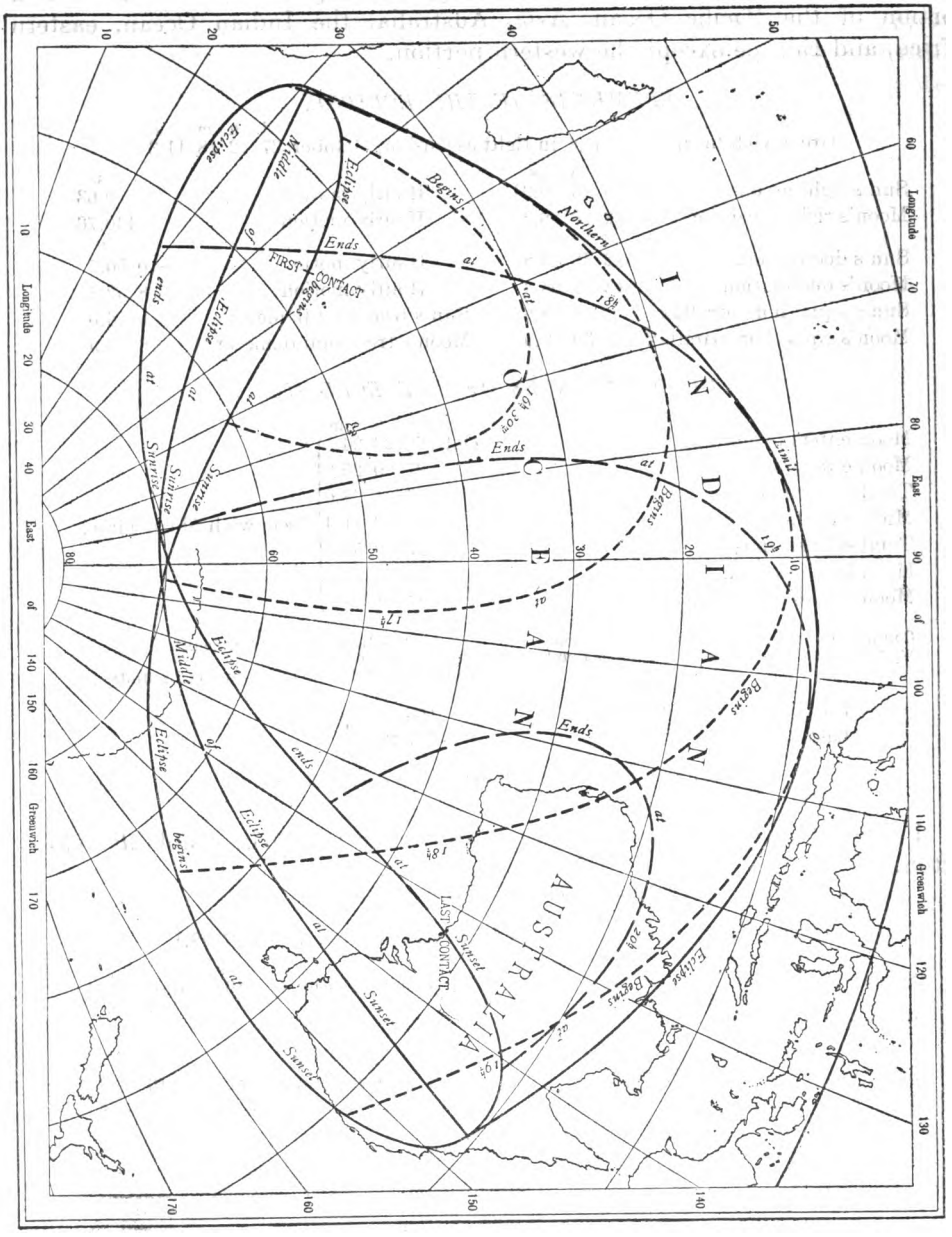
Sun and Moon's R. A.	15h 1m 56.24s		Hourly motions		10.11s and 127.74s
Sun's declination	−17° 11′ 6.7″		Hourly motion		− 0′ 42.1″
Moon's declination	−16° 7′ 37.8″		Hourly motion		− 5′ 58.7″
Sun's equa. hor. parallax		8.9″	Sun's true semidiameter		16′ 9.4″
Moon's equa. hor. parallax		55′ 26.8″	Moon's true semidiameter		15′ 5.8″

CIRCUMSTANCES OF THE ECLIPSE.

	Greenwich Mean Time.	Longitude from Greenwich.	Latitude.
	d h m	° ′	° ′
Eclipse begins	Nov. 10 1h 47.3m	+96 25	+53 12
Greatest eclipse	10 3h 52.0m	+30 0	+69 57
Eclipse ends	10 5h 57.1m	+15 20	+34 0

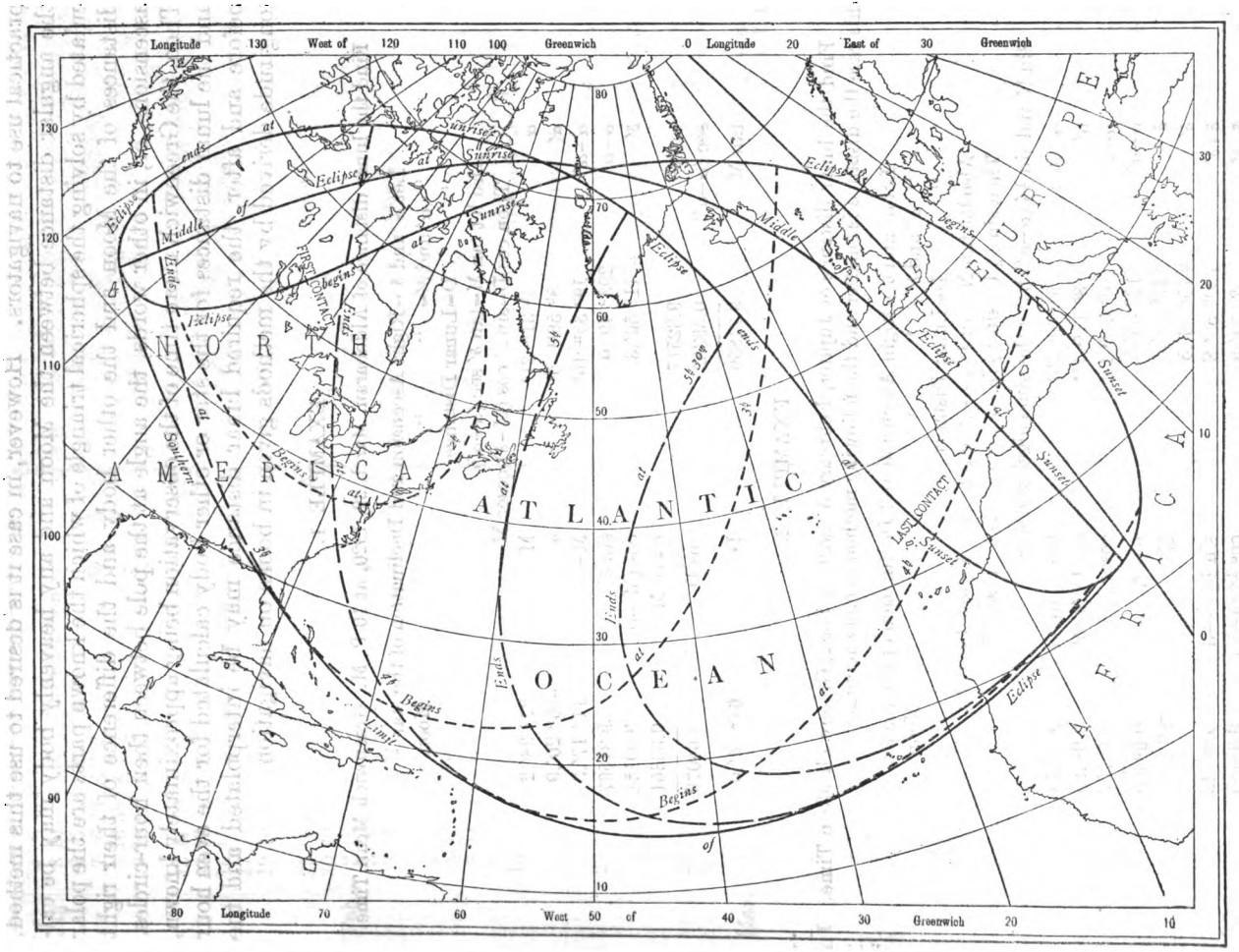
Magnitude of greatest eclipse=0.742 (Sun's diameter=1.0).

PARTIAL ECLIPSE OF MAY 17, 1920.



Note. The hours of beginning and ending are expressed in Greenwich Mean Time.

PARTIAL ECLIPSE OF NOVEMBER 10, 1920.



Notes. The times of beginning and ending are given to the nearest hour.

THE COMPUTATION OF LUNAR DISTANCES.

Tables of lunar distances are no longer given in the Almanac, in accordance with the decision of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of Aldebaran, March 29, 1920, at 10 P. M., Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

α	$4^h\ 31^m\ 21^s$	M	27° 38′.2
α'	$8^h\ 56^m\ 57^s$	δ	+16° 20′.9
$\alpha - \alpha'$	$19^h\ 35^m\ 16^s$	$M - \delta$	11° 17′.3
$\alpha - \alpha'$	293° 49′.0	$\sin \delta'$	9.31567
δ'	+ 11° 56′.3	$\cos (M - \delta)$	9.99151
		$\operatorname{cosec} M$	0.33361
$\tan \delta'$	9.32517		
$\sec (\alpha - \alpha')$	0.39382	$\cos D$	9.64079
$\tan M$	9.71899	D	64° 4′.0

EXAMPLE 2.

Find the lunar distance of Jupiter, February 3, 1920, at noon, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan N = \tan \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} \frac{1}{2} (\delta - \delta')$
Then $\sin \frac{1}{2} D = \sin \frac{1}{2} (\alpha - \alpha') \cos \frac{1}{2} (\delta + \delta') \operatorname{cosec} N$

Sin N and $\sin \frac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

α	$9^h\ 3^m\ 23^s$	$\tan \frac{1}{2} (\alpha - \alpha')$	9.05418
α'	$8^h\ 11^m\ 41^s$	$\cos \frac{1}{2} (\delta + \delta')$	9.98185
$\alpha - \alpha'$	$0^h\ 51^m\ 42^s$	$\operatorname{cosec} \frac{1}{2} (\delta - \delta')$	1.64757
$\alpha - \alpha'$	12° 55′.5	$\tan N$	0.68360
δ	+17° 44′.3	N	78° 17′.6
δ'	+15° 9′.5		
$\delta + \delta'$	+32° 53′.8	$\sin \frac{1}{2} (\alpha - \alpha')$	9.05142
$\delta - \delta'$	+ 2° 34′.8	$\cos \frac{1}{2} (\delta + \delta')$	9.98185
		$\operatorname{cosec} N$	0.00913
$\frac{1}{2} (\alpha - \alpha')$	6° 27′.8	$\sin \frac{1}{2} D$	9.04240
$\frac{1}{2} (\delta + \delta')$	+16° 26′.9	$\frac{1}{2} D$	6° 19′.8
$\frac{1}{2} (\delta - \delta')$	+ 1° 17′.4	D	12° 39′.6

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m				°	′
Jan.	3	10	–	☿	☿	in Perihelion.		
	6	5	–	☿	♉	in ♉		
	7	6	36	☌	♆	☾	♆	+ 5 11
	7	16	38	☌	♃	☾	♃	+ 6 12
	9	13	41	☌	♄	☾	♄	+ 7 9
	12	17	9	☌	♂	☾	♂	+ 4 52
	13	15	–	□	♂	☉		
	16	11	–	☿	☿	in Aphelion.		
	17	1	37	☌	♀	☾	♀	+ 0 3
	19	20	36	☌	☿	☾	☿	− 5 43
	23	6	40	☌	♁	☾	♁	− 6 4
	30	20	–	☍	♆	☉		
Feb.	2	18	–	☍	♃	☉		
	3	16	0	☌	♆	☾	♆	+ 5 6
	3	21	32	☌	♃	☾	♃	+ 6 8
	5	8	–	☌	☿	☉	Superior.	
	5	20	–	☿	☿	Greatest Hel. Lat. S.		
	5	21	14	☌	♄	☾	♄	+ 7 7
	9	22	8	☌	♂	☾	♂	+ 3 48
	13	18	–	☌	☿	♁	☿	− 1 0
	16	12	5	☌	♀	☾	♀	− 4 4
	19	16	27	☌	♁	☾	♁	− 5 58
	20	13	56	☌	☿	☾	☿	− 5 41
	21	2	–	☌	♁	☉		
	24	20	–	☿	☿	in ♌		
	25	9	–	♀	♀	in ♉		
	27	16	–	☍	♄	☉		
	29	10	–	☿	☿	in Perihelion.		
Mar.	1	23	34	☌	♆	☾	♆	+ 5 10
	2	0	44	☌	♃	☾	♃	+ 6 9
	3	11	–	☿	☿	Greatest elong. E. 18 12		
	4	3	5	☌	♄	☾	♄	+ 7 10
	8	17	26	☌	♂	☾	♂	+ 3 7
	9	22	–	☿	☿	Stationary.		
	10	17	–	☿	☿	Greatest Hel. Lat. N.		
	12	15	–	☌	♃	♆	♃	+ 0 58
	14	12	–		♂	Stationary.		
	17	21	57	☌	♀	☾	♀	− 6 18
	18	4	2	☌	♁	☾	♁	− 5 59
	19	20	–	☌	☿	☉	Inferior.	
	19	22	52	☌	☿	☾	☿	− 0 30
	20	9	59		☉	enters ♈, Spring com.		
	20	17	–	☌	♀	♁	♀	− 0 21
	29	4	18	☌	♃	☾	♃	+ 6 16
	29	5	9	☌	♆	☾	♆	+ 5 20
	30	20	–	♀	♀	in Aphelion.		
	31	7	10	☌	♄	☾	♄	+ 7 18
Apr.	1	7	–		☿	Stationary.		
	3	4	–	☿	☿	in ♉		
	3	16	–	♃		Stationary.		
Apr.	4	14	–	☌	☿	♀	☿	+ 1 12
	4	20	35	☌	♂	☾	♂	+ 2 58
	13	10	–	☿	☿	in Aphelion.		
	14	16	5	☌	♁	☾	♁	− 6 4
	16	12	43	☌	☿	☾	☿	− 6 30
	16	18	–	☿	☿	Greatest elong. W. 27 31		
	17	0	26	☌	♀	☾	♀	− 5 8
	18	23	–	♆	♆	Stationary.		
	19	16	–	☌	♃	♆	♃	+ 0 55
	20	21	–	☍	♂	☉		
	22	6	–	♀	♀	Greatest Hel. Lat. S.		
	25	10	24	☌	♆	☾	♆	+ 5 27
	25	10	59	☌	♃	☾	♃	+ 6 21
	27	11	2	☌	♄	☾	♄	+ 7 21
	27	17	–		♂	nearest ⊕		
	28	22	–	□	♆	☉		
	29	6	–	□	♃	☉		
May	1	9	54	☌	♂	☾	♂	+ 2 55
	2	–	–		☾	Tot. ecl. vis. at Wash.		
	3	19	–	☿	☿	Greatest Hel. Lat. S.		
	7	0	–	♄	♄	Stationary.		
	12	2	46	☌	♁	☾	♁	− 6 5
	13	5	–	☌	☿	♀	☿	− 0 22
	16	21	2	☌	♀	☾	♀	− 1 23
	17	–	–		☉	Par. ecl. invis. at Wash.		
	17	1	43	☌	☿	☾	☿	− 0 56
	22	17	26	☌	♆	☾	♆	+ 5 27
	22	19	–	☿	☿	in ♌		
	22	22	21	☌	♃	☾	♃	+ 6 21
	24	17	2	☌	♄	☾	♄	+ 7 16
	25	14	–	☌	☿	☉	Superior.	
	26	6	–	□	♄	☉		
	26	17	–	□	♁	☉		
	27	10	–	☿	☿	in Perihelion.		
	27	14	–		♂	in ♉		
	28	4	12	☌	♂	☾	♂	+ 2 14
June	1	13	–		♂	Stationary.		
	2	8	–	♆	♆	in ♌		
	6	16	–	☿	☿	Greatest Hel. Lat. N.		
	8	10	50	☌	♁	☾	♁	− 6 0
	10	1	–		♁	Stationary.		
	15	17	11	☌	♀	☾	♀	+ 2 53
	17	12	–	♀	♀	in ♌		
	17	17	18	☌	☿	☾	☿	+ 6 32
	19	3	8	☌	♆	☾	♆	+ 5 21
	19	14	13	☌	♃	☾	♃	+ 6 15
	21	2	37	☌	♄	☾	♄	+ 7 1
	21	5	40		☉	enters ♋, Summer com.		
	24	15	43	☌	♂	☾	♂	+ 0 56
	29	2	–	☿	☿	Greatest elong. E. 25 41		

GREENWICH MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m		° ′
June	30	3	–	☿	in ♋
July	3	8	–	☌ ☿ ☉	Superior.
	4	0	–	⊕	in Aphelion.
	5	16	13	☌ ♁ ☾ . . . . . ♁	− 5 50
	10	9	–	☿	in Aphelion.
	12	6	–	☿	Stationary.
	15	16	8	☌ ♀ ☾ . . . . . ♀	+ 5 59
	16	11	49	☌ ☿ ☾ . . . . . ☿	+ 1 18
	16	14	49	☌ ♆ ☾ . . . . . ♆	+ 5 15
	17	9	8	☌ ♃ ☾ . . . . . ♃	+ 6 6
	18	15	40	☌ ♄ ☾ . . . . . ♄	+ 6 41
	21	5	–	♀	in Perihelion.
	22	16	–	☌ ☿ ♀ . . . . . ☿	− 6 10
	22	18	5	☌ ♂ ☾ . . . . . ♂	− 0 48
	26	19	–	☌ ☿ ☉	Inferior.
	27	0	–	☌ ♀ ♆ . . . . . ♀	+ 1 19
	30	18	–	☿	Greatest Hel. Lat. S.
Aug.	1	20	14	☌ ♁ ☾ . . . . . ♁	− 5 42
	3	12	–	☌ ♆ ☉	
	3	13	–	□ ♂ ☉	
	5	18	–	☿	Stationary.
	8	6	–	☌ ♀ ♃ . . . . . ♀	+ 0 39
	12	0	–	♀	Greatest Hel. Lat. N.
	12	9	8	☌ ☿ ☾ . . . . . ☿	+ 3 23
	13	2	48	☌ ♆ ☾ . . . . . ♆	+ 5 14
	14	5	20	☌ ♃ ☾ . . . . . ♃	+ 5 56
	14	13	–	☿	Greatest elong. W. 18 44
	14	16	28	☌ ♀ ☾ . . . . . ♀	+ 6 23
	15	6	51	☌ ♄ ☾ . . . . . ♄	+ 6 22
	18	18	–	☿	in ♌
	20	6	54	☌ ♂ ☾ . . . . . ♂	− 2 42
	21	6	–	☌ ☿ ♆ . . . . . ☿	+ 0 32
	21	21	–	☌ ♃ ☉	
	22	8	–	☌ ♀ ♄ . . . . . ♀	− 0 23
	23	9	–	☿	in Perihelion.
	26	19	–	☍ ♁ ☉	
	29	0	41	☌ ♁ ☾ . . . . . ♁	− 5 41
	31	16	–	☌ ☿ ♃ . . . . . ☿	+ 0 57
Sept.	2	15	–	☿	Greatest Hel. Lat. N.
	7	12	–	☌ ♄ ☉	
	8	2	–	☌ ☿ ♄ . . . . . ☿	− 0 6
	8	14	–	☌ ☿ ☉	Superior.
	9	13	23	☌ ♆ ☾ . . . . . ♆	+ 5 19
	11	1	0	☌ ♃ ☾ . . . . . ♃	+ 5 47
	11	22	20	☌ ♄ ☾ . . . . . ♄	+ 6 10
	12	11	7	☌ ☿ ☾ . . . . . ☿	+ 5 17
	13	16	32	☌ ♀ ☾ . . . . . ♀	+ 3 24
	18	3	31	☌ ♂ ☾ . . . . . ♂	− 4 30
	22	20	29	☉	enters ♎, Autumn com.
	25	6	48	☌ ♁ ☾ . . . . . ♁	− 5 47
Sept.	26	3	–	☿	in ♋
Oct.	6	8	–	☿	in Aphelion.
	6	21	30	☌ ♆ ☾ . . . . . ♆	+ 5 26
	7	2	–	♀	in ♋
	8	18	39	☌ ♃ ☾ . . . . . ♃	+ 5 39
	9	12	24	☌ ♄ ☾ . . . . . ♄	+ 6 2
	13	6	55	☌ ☿ ☾ . . . . . ☿	− 2 32
	13	19	10	☌ ♀ ☾ . . . . . ♀	− 1 22
	17	6	3	☌ ♂ ☾ . . . . . ♂	− 5 56
	22	14	37	☌ ♁ ☾ . . . . . ♁	− 5 52
	24	22	–	☿	Greatest elong. E. 24 8
	26	17	–	☿	Greatest Hel. Lat. S.
	27	–	–	☾	Tot. ecl. invis. at Wash.
	31	12	–	♂	Greatest Hel. Lat. S.
Nov.	3	3	38	☌ ♆ ☾ . . . . . ♆	+ 5 29
	5	6	–	☿	Stationary.
	5	9	16	☌ ♃ ☾ . . . . . ♃	+ 5 30
	5	23	–	□ ♆ ☉	
	5	23	55	☌ ♄ ☾ . . . . . ♄	+ 5 57
	10	–	–	☉	Par. ecl. vis. at Wash.
	10	12	–	♀	in Aphelion.
	11	0	48	☌ ☿ ☾ . . . . . ☿	− 3 16
	11	2	–	♁	Stationary.
	13	4	45	☌ ♀ ☾ . . . . . ♀	− 5 35
	14	18	–	☿	in ♌
	15	12	0	☌ ♂ ☾ . . . . . ♂	− 6 44
	15	18	–	☌ ☿ ☉	Inferior.
	15	23	–	♆	Stationary.
	18	23	13	☌ ♁ ☾ . . . . . ♁	− 5 49
	19	8	–	☿	in Perihelion.
	23	21	–	□ ♁ ☉	
	24	22	–	☿	Stationary.
	25	4	–	♂	in Perihelion.
	29	15	–	☿	Greatest Hel. Lat. N.
	30	9	46	☌ ♆ ☾ . . . . . ♆	+ 5 24
Dec.	2	20	49	☌ ♃ ☾ . . . . . ♃	+ 5 19
	2	22	–	♀	Greatest Hel. Lat. S.
	3	0	–	☿	Greatest elong. W. 20 30
	3	8	58	☌ ♄ ☾ . . . . . ♄	+ 5 50
	8	3	34	☌ ☿ ☾ . . . . . ☿	+ 0 2
	9	19	–	□ ♃ ☉	
	13	18	25	☌ ♀ ☾ . . . . . ♀	− 7 27
	14	18	6	☌ ♂ ☾ . . . . . ♂	− 6 35
	16	5	–	□ ♄ ☉	
	16	7	36	☌ ♁ ☾ . . . . . ♁	− 5 36
	21	15	17	☉	enters ♑, Winter com.
	23	2	–	☿	in ♋
	27	17	49	☌ ♆ ☾ . . . . . ♆	+ 5 15
	30	6	5	☌ ♃ ☾ . . . . . ♃	+ 5 7
	30	16	51	☌ ♄ ☾ . . . . . ♄	+ 5 40
	31	17	–	⊕	in Perihelion.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1920.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

With this sidereal time take out the correction from the table below, and add it to or subtract it from the true altitude, according to its sign. The result is the approximate latitude of the place.

Example.—June 10, 1920, at $10^h\ 40^m\ 30^s$ P. M., mean solar time, in longitude 74° west of Greenwich, suppose the true altitude of Polaris to be 39° 46′; required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from page 2, for $10^h\ 40^m\ 30^s$	+	1	45
Greenwich sidereal time of mean noon, June 10, page 2	5	14	9
Reduction from page 2, for longitude ($=4^h\ 56^m$ west, or plus)	+	0	49
Sum (having regard to signs) is equal to local sidereal time	15	57	13
	°		′
True altitude		39	46
Correction from table below	+	0	54
Approximate latitude	+	40	40

Local S. T.	0^h		1^h		2^h		3^h		4^h		5^h	
m	° ′		° ′		° ′		° ′		° ′		° ′	
0	−1 1.6	11	−1 6.4	4	−1 6.6	4	−1 2.2	12	−0 53.4	18	−0 41.0	24
10	1 2.7	10	1 6.8	2	1 6.2	6	1 1.0	13	0 51.6	20	0 38.6	24
20	1 3.7	9	1 7.0	1	1 5.6	7	0 59.7	14	0 49.6	20	0 36.2	25
30	−1 4.6	7	−1 7.1	1	−1 4.9	8	−0 58.3	15	−0 47.6	21	−0 33.7	26
40	1 5.3	6	1 7.0	1	1 4.1	9	0 56.8	16	0 45.5	22	0 31.1	27
50	1 5.9	5	1 6.9	3	1 3.2	10	0 55.2	18	0 43.3	23	0 28.4	26
60	−1 6.4		−1 6.6		−1 2.2		−0 53.4		−0 41.0		−0 25.8	

Local S. T.	6^h		7^h		8^h		9^h		10^h		11^h	
m	° ′		° ′		° ′		° ′		° ′		° ′	
0	−0 25.8	28	−0 8.8	29	+0 8.7	29	+0 25.6	27	+0 40.7	23	+0 53.0	18
10	0 23.0	28	0 5.9	29	0 11.6	29	0 28.3	26	0 43.0	22	0 54.8	16
20	0 20.2	28	−0 3.0	30	0 14.5	28	0 30.9	25	0 45.2	21	0 56.4	15
30	−0 17.4	28	0 0.0	29	+0 17.3	28	+0 33.4	25	+0 47.3	20	+0 57.9	14
40	0 14.6	29	+0 2.9	29	0 20.1	28	0 35.9	25	0 49.3	19	0 59.3	13
50	0 11.7	29	0 5.8	29	0 22.9	27	0 38.4	23	0 51.2	18	1 0.6	12
60	−0 8.8		+0 8.7		+0 25.6		+0 40.7		+0 53.0		+1 1.8	

Local S. T.	12^h		13^h		14^h		15^h		16^h		17^h	
m	° ′		° ′		° ′		° ′		° ′		° ′	
0	+1 1.8	11	+1 6.4	4	+1 6.6	4	+1 2.3	11	+0 53.9	18	+0 41.8	23
10	1 2.9	9	1 6.8	2	1 6.2	5	1 1.2	12	0 52.1	19	0 39.5	24
20	1 3.8	9	1 7.0	1	1 5.7	7	1 0.0	14	0 50.2	20	0 37.1	25
30	+1 4.7	7	+1 7.1	1	+1 5.0	8	+0 58.6	15	+0 48.2	20	+0 34.6	25
40	1 5.4	6	1 7.0	1	1 4.2	8	0 57.1	15	0 46.2	22	0 32.1	26
50	1 6.0	4	1 6.9	3	1 3.4	11	0 55.6	17	0 44.0	22	0 29.5	26
60	+1 6.4		+1 6.6		+1 2.3		+0 53.9		+0 41.8		+0 26.9	

Local S. T.	18^h		19^h		20^h		21^h		22^h		23^h	
m	° ′		° ′		° ′		° ′		° ′		° ′	
0	+0 26.9	27	+0 10.1	29	−0 7.4	29	−0 24.5	27	−0 39.9	23	−0 52.6	17
10	0 24.2	28	0 7.2	29	0 10.3	29	0 27.2	26	0 42.2	22	0 54.3	17
20	0 21.4	28	0 4.3	29	0 13.2	29	0 29.8	26	0 44.4	22	0 56.0	16
30	+0 18.6	28	+0 1.4	30	−0 16.1	28	−0 32.4	26	−0 46.6	21	−0 57.6	14
40	0 15.8	28	−0 1.6	29	0 18.9	28	0 35.0	24	0 48.7	19	0 59.0	14
50	0 13.0	29	0 4.5	29	0 21.7	28	0 37.4	25	0 50.6	20	1 0.4	12
60	+0 10.1		−0 7.4		−0 24.5		−0 39.9		−0 52.6		−1 1.6	

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
0	0 0.0	0 9.8	0 19.7	0 29.5	0 39.3	0 49.1	0 59.0	1 8.8	1 18.6	1 28.5	1 38.3	1 48.1
1	0 0.2	0 10.0	0 19.8	0 29.7	0 39.5	0 49.3	0 59.1	1 9.0	1 18.8	1 28.6	1 38.5	1 48.3
2	0 0.3	0 10.2	0 20.0	0 29.8	0 39.6	0 49.5	0 59.3	1 9.1	1 19.0	1 28.8	1 38.6	1 48.5
3	0 0.5	0 10.3	0 20.2	0 30.0	0 39.8	0 49.6	0 59.5	1 9.3	1 19.1	1 29.0	1 38.8	1 48.6
4	0 0.7	0 10.5	0 20.3	0 30.1	0 40.0	0 49.8	0 59.6	1 9.5	1 19.3	1 29.1	1 39.0	1 48.8
5	0 0.8	0 10.6	0 20.5	0 30.3	0 40.1	0 50.0	0 59.8	1 9.6	1 19.5	1 29.3	1 39.1	1 48.9
6	0 1.0	0 10.8	0 20.6	0 30.5	0 40.3	0 50.1	1 0.0	1 9.8	1 19.6	1 29.4	1 39.3	1 49.1
7	0 1.1	0 11.0	0 20.8	0 30.6	0 40.5	0 50.3	1 0.1	1 10.0	1 19.8	1 29.6	1 39.4	1 49.3
8	0 1.3	0 11.1	0 21.0	0 30.8	0 40.6	0 50.5	1 0.3	1 10.1	1 19.9	1 29.8	1 39.6	1 49.4
9	0 1.5	0 11.3	0 21.1	0 31.0	0 40.8	0 50.6	1 0.5	1 10.3	1 20.1	1 29.9	1 39.8	1 49.6
10	0 1.6	0 11.5	0 21.3	0 31.1	0 41.0	0 50.8	1 0.6	1 10.4	1 20.3	1 30.1	1 39.9	1 49.8
11	0 1.8	0 11.6	0 21.5	0 31.3	0 41.1	0 51.0	1 0.8	1 10.6	1 20.4	1 30.3	1 40.1	1 49.9
12	0 2.0	0 11.8	0 21.6	0 31.5	0 41.3	0 51.1	1 0.9	1 10.8	1 20.6	1 30.4	1 40.3	1 50.1
13	0 2.1	0 12.0	0 21.8	0 31.6	0 41.4	0 51.3	1 1.1	1 10.9	1 20.8	1 30.6	1 40.4	1 50.3
14	0 2.3	0 12.1	0 22.0	0 31.8	0 41.6	0 51.4	1 1.3	1 11.1	1 20.9	1 30.8	1 40.6	1 50.4
15	0 2.5	0 12.3	0 22.1	0 31.9	0 41.8	0 51.6	1 1.4	1 11.3	1 21.1	1 30.9	1 40.8	1 50.6
16	0 2.6	0 12.5	0 22.3	0 32.1	0 41.9	0 51.8	1 1.6	1 11.4	1 21.3	1 31.1	1 40.9	1 50.7
17	0 2.8	0 12.6	0 22.4	0 32.3	0 42.1	0 51.9	1 1.8	1 11.6	1 21.4	1 31.3	1 41.1	1 50.9
18	0 2.9	0 12.8	0 22.6	0 32.4	0 42.3	0 52.1	1 1.9	1 11.8	1 21.6	1 31.4	1 41.2	1 51.1
19	0 3.1	0 12.9	0 22.8	0 32.6	0 42.4	0 52.3	1 2.1	1 11.9	1 21.7	1 31.6	1 41.4	1 51.2
20	0 3.3	0 13.1	0 22.9	0 32.8	0 42.6	0 52.4	1 2.3	1 12.1	1 21.9	1 31.7	1 41.6	1 51.4
21	0 3.4	0 13.3	0 23.1	0 32.9	0 42.8	0 52.6	1 2.4	1 12.2	1 22.1	1 31.9	1 41.7	1 51.6
22	0 3.6	0 13.4	0 23.3	0 33.1	0 42.9	0 52.8	1 2.6	1 12.4	1 22.2	1 32.1	1 41.9	1 51.7
23	0 3.8	0 13.6	0 23.4	0 33.3	0 43.1	0 52.9	1 2.7	1 12.6	1 22.4	1 32.2	1 42.1	1 51.9
24	0 3.9	0 13.8	0 23.6	0 33.4	0 43.2	0 53.1	1 2.9	1 12.7	1 22.6	1 32.4	1 42.2	1 52.1
25	0 4.1	0 13.9	0 23.8	0 33.6	0 43.4	0 53.2	1 3.1	1 12.9	1 22.7	1 32.6	1 42.4	1 52.2
26	0 4.3	0 14.1	0 23.9	0 33.7	0 43.6	0 53.4	1 3.2	1 13.1	1 22.9	1 32.7	1 42.6	1 52.4
27	0 4.4	0 14.3	0 24.1	0 33.9	0 43.7	0 53.6	1 3.4	1 13.2	1 23.1	1 32.9	1 42.7	1 52.5
28	0 4.6	0 14.4	0 24.2	0 34.1	0 43.9	0 53.7	1 3.6	1 13.4	1 23.2	1 33.1	1 42.9	1 52.7
29	0 4.8	0 14.6	0 24.4	0 34.2	0 44.1	0 53.9	1 3.7	1 13.6	1 23.4	1 33.2	1 43.0	1 52.9
30	0 4.9	0 14.7	0 24.6	0 34.4	0 44.2	0 54.1	1 3.9	1 13.7	1 23.6	1 33.4	1 43.2	1 53.0
31	0 5.1	0 14.9	0 24.7	0 34.6	0 44.4	0 54.2	1 4.1	1 13.9	1 23.7	1 33.5	1 43.4	1 53.2
32	0 5.2	0 15.1	0 24.9	0 34.7	0 44.6	0 54.4	1 4.2	1 14.0	1 23.9	1 33.7	1 43.5	1 53.4
33	0 5.4	0 15.2	0 25.1	0 34.9	0 44.7	0 54.6	1 4.4	1 14.2	1 24.0	1 33.9	1 43.7	1 53.5
34	0 5.6	0 15.4	0 25.2	0 35.1	0 44.9	0 54.7	1 4.5	1 14.4	1 24.2	1 34.0	1 43.9	1 53.7
35	0 5.7	0 15.6	0 25.4	0 35.2	0 45.1	0 54.9	1 4.7	1 14.5	1 24.4	1 34.2	1 44.0	1 53.9
36	0 5.9	0 15.7	0 25.6	0 35.4	0 45.2	0 55.0	1 4.9	1 14.7	1 24.5	1 34.4	1 44.2	1 54.0
37	0 6.1	0 15.9	0 25.7	0 35.6	0 45.4	0 55.2	1 5.0	1 14.9	1 24.7	1 34.5	1 44.4	1 54.2
38	0 6.2	0 16.1	0 25.9	0 35.7	0 45.5	0 55.4	1 5.2	1 15.0	1 24.9	1 34.7	1 44.5	1 54.4
39	0 6.4	0 16.2	0 26.0	0 35.9	0 45.7	0 55.5	1 5.4	1 15.2	1 25.0	1 34.9	1 44.7	1 54.5
40	0 6.6	0 16.4	0 26.2	0 36.0	0 45.9	0 55.7	1 5.5	1 15.4	1 25.2	1 35.0	1 44.8	1 54.7
41	0 6.7	0 16.5	0 26.4	0 36.2	0 46.0	0 55.9	1 5.7	1 15.5	1 25.4	1 35.2	1 45.0	1 54.8
42	0 6.9	0 16.7	0 26.5	0 36.4	0 46.2	0 56.0	1 5.9	1 15.7	1 25.5	1 35.3	1 45.2	1 55.0
43	0 7.0	0 16.9	0 26.7	0 36.5	0 46.4	0 56.2	1 6.0	1 15.9	1 25.7	1 35.5	1 45.3	1 55.2
44	0 7.2	0 17.0	0 26.9	0 36.7	0 46.5	0 56.4	1 6.2	1 16.0	1 25.8	1 35.7	1 45.5	1 55.3
45	0 7.4	0 17.2	0 27.0	0 36.9	0 46.7	0 56.5	1 6.4	1 16.2	1 26.0	1 35.8	1 45.7	1 55.5
46	0 7.5	0 17.4	0 27.2	0 37.0	0 46.9	0 56.7	1 6.5	1 16.3	1 26.2	1 36.0	1 45.8	1 55.7
47	0 7.7	0 17.5	0 27.4	0 37.2	0 47.0	0 56.8	1 6.7	1 16.5	1 26.3	1 36.2	1 46.0	1 55.8
48	0 7.9	0 17.7	0 27.5	0 37.4	0 47.2	0 57.0	1 6.8	1 16.7	1 26.5	1 36.3	1 46.2	1 56.0
49	0 8.0	0 17.9	0 27.7	0 37.5	0 47.3	0 57.2	1 7.0	1 16.8	1 26.7	1 36.5	1 46.3	1 56.2
50	0 8.2	0 18.0	0 27.8	0 37.7	0 47.5	0 57.3	1 7.2	1 17.0	1 26.8	1 36.7	1 46.5	1 56.3
51	0 8.4	0 18.2	0 28.0	0 37.8	0 47.7	0 57.5	1 7.3	1 17.2	1 27.0	1 36.8	1 46.7	1 56.5
52	0 8.5	0 18.3	0 28.2	0 38.0	0 47.8	0 57.7	1 7.5	1 17.3	1 27.2	1 37.0	1 46.8	1 56.6
53	0 8.7	0 18.5	0 28.3	0 38.2	0 48.0	0 57.8	1 7.7	1 17.5	1 27.3	1 37.1	1 47.0	1 56.8
54	0 8.8	0 18.7	0 28.5	0 38.3	0 48.2	0 58.0	1 7.8	1 17.7	1 27.5	1 37.3	1 47.1	1 57.0
55	0 9.0	0 18.8	0 28.7	0 38.5	0 48.3	0 58.2	1 8.0	1 17.8	1 27.6	1 37.5	1 47.3	1 57.1
56	0 9.2	0 19.0	0 28.8	0 38.7	0 48.5	0 58.3	1 8.2	1 18.0	1 27.8	1 37.6	1 47.5	1 57.3
57	0 9.3	0 19.2	0 29.0	0 38.8	0 48.7	0 58.5	1 8.3	1 18.1	1 28.0	1 37.8	1 47.6	1 57.5
58	0 9.5	0 19.3	0 29.2	0 39.0	0 48.8	0 58.6	1 8.5	1 18.3	1 28.1	1 38.0	1 47.8	1 57.6
59	0 9.7	0 19.5	0 29.3	0 39.2	0 49.0	0 58.8	1 8.6	1 18.5	1 28.3	1 38.1	1 48.0	1 57.8

SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
m	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
0	1 58.0	2 7.8	2 17.6	2 27.4	2 37.3	2 47.1	2 56.9	3 6.8	3 16.6	3 26.4	3 36.2	3 46.1
1	1 58.1	2 7.9	2 17.8	2 27.6	2 37.4	2 47.3	2 57.1	3 6.9	3 16.8	3 26.6	3 36.4	3 46.2
2	1 58.3	2 8.1	2 17.9	2 27.8	2 37.6	2 47.4	2 57.3	3 7.1	3 16.9	3 26.7	3 36.6	3 46.4
3	1 58.4	2 8.3	2 18.1	2 27.9	2 37.8	2 47.6	2 57.4	3 7.2	3 17.1	3 26.9	3 36.7	3 46.6
4	1 58.6	2 8.4	2 18.3	2 28.1	2 37.9	2 47.8	2 57.6	3 7.4	3 17.2	3 27.1	3 36.9	3 46.7
5	1 58.8	2 8.6	2 18.4	2 28.3	2 38.1	2 47.9	2 57.8	3 7.6	3 17.4	3 27.2	3 37.1	3 46.9
6	1 58.9	2 8.8	2 18.6	2 28.4	2 38.3	2 48.0	2 57.9	3 7.7	3 17.6	3 27.4	3 37.2	3 47.1
7	1 59.1	2 8.9	2 18.8	2 28.6	2 38.4	2 48.2	2 58.1	3 7.9	3 17.7	3 27.6	3 37.4	3 47.2
8	1 59.3	2 9.1	2 18.9	2 28.8	2 38.6	2 48.4	2 58.2	3 8.1	3 17.9	3 27.7	3 37.6	3 47.4
9	1 59.4	2 9.3	2 19.1	2 28.9	2 38.7	2 48.6	2 58.4	3 8.2	3 18.1	3 27.9	3 37.7	3 47.6
10	1 59.6	2 9.4	2 19.3	2 29.1	2 38.9	2 48.7	2 58.6	3 8.4	3 18.2	3 28.1	3 37.9	3 47.7
11	1 59.8	2 9.6	2 19.4	2 29.2	2 39.1	2 48.9	2 58.7	3 8.6	3 18.4	3 28.2	3 38.1	3 47.9
12	1 59.9	2 9.8	2 19.6	2 29.4	2 39.2	2 49.1	2 58.9	3 8.7	3 18.6	3 28.4	3 38.2	3 48.0
13	2 0.1	2 9.9	2 19.7	2 29.6	2 39.4	2 49.2	2 59.1	3 8.9	3 18.7	3 28.6	3 38.4	3 48.2
14	2 0.2	2 10.1	2 19.9	2 29.7	2 39.6	2 49.4	2 59.2	3 9.1	3 18.9	3 28.7	3 38.5	3 48.4
15	2 0.4	2 10.2	2 20.1	2 29.9	2 39.7	2 49.6	2 59.4	3 9.2	3 19.0	3 28.9	3 38.7	3 48.5
16	2 0.6	2 10.4	2 20.2	2 30.1	2 39.9	2 49.7	2 59.6	3 9.4	3 19.2	3 29.0	3 38.9	3 48.7
17	2 0.7	2 10.6	2 20.4	2 30.2	2 40.1	2 49.9	2 59.7	3 9.5	3 19.4	3 29.2	3 39.0	3 48.9
18	2 0.9	2 10.7	2 20.6	2 30.4	2 40.2	2 50.1	2 59.9	3 9.7	3 19.5	3 29.4	3 39.2	3 49.0
19	2 1.1	2 10.9	2 20.7	2 30.6	2 40.4	2 50.2	3 0.0	3 9.9	3 19.7	3 29.5	3 39.4	3 49.2
20	2 1.2	2 11.1	2 20.9	2 30.7	2 40.5	2 50.4	3 0.2	3 10.0	3 19.9	3 29.7	3 39.5	3 49.4
21	2 1.4	2 11.2	2 21.1	2 30.9	2 40.7	2 50.5	3 0.4	3 10.2	3 20.0	3 29.9	3 39.7	3 49.5
22	2 1.6	2 11.4	2 21.2	2 31.0	2 40.9	2 50.7	3 0.5	3 10.4	3 20.2	3 30.0	3 39.9	3 49.7
23	2 1.7	2 11.6	2 21.4	2 31.2	2 41.0	2 50.9	3 0.7	3 10.5	3 20.4	3 30.2	3 40.0	3 49.8
24	2 1.9	2 11.7	2 21.5	2 31.4	2 41.2	2 51.0	3 0.9	3 10.7	3 20.5	3 30.4	3 40.2	3 50.0
25	2 2.0	2 11.9	2 21.7	2 31.5	2 41.4	2 51.2	3 1.0	3 10.9	3 20.7	3 30.5	3 40.3	3 50.2
26	2 2.2	2 12.0	2 21.9	2 31.7	2 41.5	2 51.4	3 1.2	3 11.0	3 20.9	3 30.7	3 40.5	3 50.3
27	2 2.4	2 12.2	2 22.0	2 31.9	2 41.7	2 51.5	3 1.4	3 11.2	3 21.0	3 30.8	3 40.7	3 50.5
28	2 2.5	2 12.4	2 22.2	2 32.0	2 41.9	2 51.7	3 1.5	3 11.3	3 21.2	3 31.0	3 40.8	3 50.7
29	2 2.7	2 12.5	2 22.4	2 32.2	2 42.0	2 51.9	3 1.7	3 11.5	3 21.3	3 31.2	3 41.0	3 50.8
30	2 2.9	2 12.7	2 22.5	2 32.4	2 42.2	2 52.0	3 1.8	3 11.7	3 21.5	3 31.3	3 41.2	3 51.0
31	2 3.0	2 12.9	2 22.7	2 32.5	2 42.4	2 52.2	3 2.0	3 11.8	3 21.7	3 31.5	3 41.3	3 51.2
32	2 3.2	2 13.0	2 22.9	2 32.7	2 42.5	2 52.3	3 2.2	3 12.0	3 21.8	3 31.7	3 41.5	3 51.3
33	2 3.4	2 13.2	2 23.0	2 32.8	2 42.7	2 52.5	3 2.3	3 12.2	3 22.0	3 31.8	3 41.7	3 51.5
34	2 3.5	2 13.4	2 23.2	2 33.0	2 42.8	2 52.7	3 2.5	3 12.3	3 22.2	3 32.0	3 41.8	3 51.6
35	2 3.7	2 13.5	2 23.3	2 33.2	2 43.0	2 52.8	3 2.6	3 12.5	3 22.3	3 32.2	3 42.0	3 51.8
36	2 3.9	2 13.7	2 23.5	2 33.3	2 43.2	2 53.0	3 2.8	3 12.7	3 22.5	3 32.3	3 42.1	3 52.0
37	2 4.0	2 13.8	2 23.7	2 33.5	2 43.3	2 53.2	3 3.0	3 12.8	3 22.7	3 32.5	3 42.3	3 52.1
38	2 4.2	2 14.0	2 23.8	2 33.7	2 43.5	2 53.3	3 3.2	3 13.0	3 22.8	3 32.6	3 42.5	3 52.3
39	2 4.3	2 14.2	2 24.0	2 33.8	2 43.7	2 53.5	3 3.3	3 13.2	3 23.0	3 32.8	3 42.6	3 52.5
40	2 4.5	2 14.3	2 24.2	2 34.0	2 43.8	2 53.7	3 3.5	3 13.3	3 23.1	3 33.0	3 42.8	3 52.6
41	2 4.7	2 14.5	2 24.3	2 34.2	2 44.0	2 53.8	3 3.6	3 13.5	3 23.3	3 33.1	3 43.0	3 52.8
42	2 4.8	2 14.7	2 24.5	2 34.3	2 44.2	2 54.0	3 3.8	3 13.6	3 23.5	3 33.3	3 43.1	3 53.0
43	2 5.0	2 14.8	2 24.7	2 34.5	2 44.3	2 54.1	3 4.0	3 13.8	3 23.6	3 33.5	3 43.3	3 53.1
44	2 5.2	2 15.0	2 24.8	2 34.7	2 44.5	2 54.3	3 4.1	3 14.0	3 23.8	3 33.6	3 43.5	3 53.3
45	2 5.3	2 15.2	2 25.0	2 34.8	2 44.6	2 54.5	3 4.3	3 14.1	3 24.0	3 33.8	3 43.6	3 53.5
46	2 5.5	2 15.3	2 25.2	2 35.0	2 44.8	2 54.6	3 4.5	3 14.3	3 24.1	3 34.0	3 43.8	3 53.6
47	2 5.7	2 15.5	2 25.3	2 35.1	2 45.0	2 54.8	3 4.6	3 14.5	3 24.3	3 34.1	3 44.0	3 53.8
48	2 5.8	2 15.6	2 25.5	2 35.3	2 45.1	2 55.0	3 4.8	3 14.6	3 24.5	3 34.3	3 44.1	3 53.9
49	2 6.0	2 15.8	2 25.6	2 35.5	2 45.3	2 55.1	3 5.0	3 14.8	3 24.6	3 34.4	3 44.3	3 54.1
50	2 6.1	2 16.0	2 25.8	2 35.6	2 45.5	2 55.3	3 5.1	3 15.0	3 24.8	3 34.6	3 44.4	3 54.3
51	2 6.3	2 16.1	2 26.0	2 35.8	2 45.6	2 55.5	3 5.3	3 15.1	3 24.9	3 34.8	3 44.6	3 54.4
52	2 6.5	2 16.3	2 26.1	2 36.0	2 45.8	2 55.6	3 5.5	3 15.3	3 25.1	3 34.9	3 44.8	3 54.6
53	2 6.6	2 16.5	2 26.3	2 36.1	2 46.0	2 55.8	3 5.6	3 15.4	3 25.3	3 35.1	3 44.9	3 54.8
54	2 6.8	2 16.6	2 26.5	2 36.3	2 46.1	2 55.9	3 5.8	3 15.6	3 25.4	3 35.3	3 45.1	3 54.9
55	2 7.0	2 16.8	2 26.6	2 36.5	2 46.3	2 56.1	3 5.9	3 15.8	3 25.6	3 35.4	3 45.3	3 55.1
56	2 7.1	2 17.0	2 26.8	2 36.6	2 46.4	2 56.3	3 6.1	3 15.9	3 25.8	3 35.6	3 45.4	3 55.3
57	2 7.3	2 17.1	2 27.0	2 36.8	2 46.6	2 56.4	3 6.3	3 16.1	3 25.9	3 35.8	3 45.6	3 55.4
58	2 7.5	2 17.3	2 27.1	2 36.9	2 46.8	2 56.6	3 6.4	3 16.3	3 26.1	3 35.9	3 45.8	3 55.6
59	2 7.6	2 17.4	2 27.3	2 37.1	2 46.9	2 56.8	3 6.6	3 16.4	3 26.3	3 36.1	3 45.9	3 55.7

TABLE III.

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
0	0 0.0	0 9.9	0 19.7	0 29.6	0 39.4	0 49.3	0 59.1	1 9.0	1 18.9	1 28.7	1 38.6	1 48.4
1	0 0.2	0 10.0	0 19.9	0 29.7	0 39.6	0 49.4	0 59.3	1 9.2	1 19.0	1 28.9	1 38.7	1 48.6
2	0 0.3	0 10.2	0 20.0	0 29.9	0 39.8	0 49.6	0 59.5	1 9.3	1 19.2	1 29.0	1 38.9	1 48.8
3	0 0.5	0 10.3	0 20.2	0 30.1	0 39.9	0 49.8	0 59.6	1 9.5	1 19.3	1 29.2	1 39.1	1 48.9
4	0 0.7	0 10.5	0 20.4	0 30.2	0 40.1	0 49.9	0 59.8	1 9.7	1 19.5	1 29.4	1 39.2	1 49.1
5	0 0.8	0 10.7	0 20.5	0 30.4	0 40.2	0 50.1	1 0.0	1 9.8	1 19.7	1 29.5	1 39.4	1 49.2
6	0 1.0	0 10.8	0 20.7	0 30.6	0 40.4	0 50.3	1 0.1	1 10.0	1 19.8	1 29.7	1 39.6	1 49.4
7	0 1.2	0 11.0	0 20.9	0 30.7	0 40.6	0 50.4	1 0.3	1 10.1	1 20.0	1 29.9	1 39.7	1 49.6
8	0 1.3	0 11.2	0 21.0	0 30.9	0 40.7	0 50.6	1 0.5	1 10.3	1 20.2	1 30.0	1 39.9	1 49.7
9	0 1.5	0 11.3	0 21.2	0 31.0	0 40.9	0 50.8	1 0.6	1 10.5	1 20.3	1 30.2	1 40.0	1 49.9
10	0 1.6	0 11.5	0 21.4	0 31.2	0 41.1	0 50.9	1 0.8	1 10.6	1 20.5	1 30.4	1 40.2	1 50.1
11	0 1.8	0 11.7	0 21.5	0 31.4	0 41.2	0 51.1	1 0.9	1 10.8	1 20.7	1 30.5	1 40.4	1 50.2
12	0 2.0	0 11.8	0 21.7	0 31.5	0 41.4	0 51.3	1 1.1	1 11.0	1 20.8	1 30.7	1 40.5	1 50.4
13	0 2.1	0 12.0	0 21.8	0 31.7	0 41.6	0 51.4	1 1.3	1 11.1	1 21.0	1 30.8	1 40.7	1 50.6
14	0 2.3	0 12.2	0 22.0	0 31.9	0 41.7	0 51.6	1 1.4	1 11.3	1 21.2	1 31.0	1 40.9	1 50.7
15	0 2.5	0 12.3	0 22.2	0 32.0	0 41.9	0 51.7	1 1.6	1 11.5	1 21.3	1 31.2	1 41.0	1 50.9
16	0 2.6	0 12.5	0 22.3	0 32.2	0 42.1	0 51.9	1 1.8	1 11.6	1 21.5	1 31.3	1 41.2	1 51.0
17	0 2.8	0 12.6	0 22.5	0 32.4	0 42.2	0 52.1	1 1.9	1 11.8	1 21.6	1 31.5	1 41.4	1 51.2
18	0 3.0	0 12.8	0 22.7	0 32.5	0 42.4	0 52.2	1 2.1	1 12.0	1 21.8	1 31.7	1 41.5	1 51.4
19	0 3.1	0 13.0	0 22.8	0 32.7	0 42.5	0 52.4	1 2.3	1 12.1	1 22.0	1 31.8	1 41.7	1 51.5
20	0 3.3	0 13.1	0 23.0	0 32.9	0 42.7	0 52.6	1 2.4	1 12.3	1 22.1	1 32.0	1 41.8	1 51.7
21	0 3.4	0 13.3	0 23.2	0 33.0	0 42.9	0 52.7	1 2.6	1 12.4	1 22.3	1 32.2	1 42.0	1 51.9
22	0 3.6	0 13.5	0 23.3	0 33.2	0 43.0	0 52.9	1 2.8	1 12.6	1 22.5	1 32.3	1 42.2	1 52.0
23	0 3.8	0 13.6	0 23.5	0 33.3	0 43.2	0 53.1	1 2.9	1 12.8	1 22.6	1 32.5	1 42.3	1 52.2
24	0 3.9	0 13.8	0 23.7	0 33.5	0 43.4	0 53.2	1 3.1	1 12.9	1 22.8	1 32.7	1 42.5	1 52.4
25	0 4.1	0 14.0	0 23.8	0 33.7	0 43.5	0 53.4	1 3.2	1 13.1	1 23.0	1 32.8	1 42.7	1 52.5
26	0 4.3	0 14.1	0 24.0	0 33.8	0 43.7	0 53.6	1 3.4	1 13.3	1 23.1	1 33.0	1 42.8	1 52.7
27	0 4.4	0 14.3	0 24.1	0 34.0	0 43.9	0 53.7	1 3.6	1 13.4	1 23.3	1 33.1	1 43.0	1 52.9
28	0 4.6	0 14.5	0 24.3	0 34.2	0 44.0	0 53.9	1 3.7	1 13.6	1 23.5	1 33.3	1 43.2	1 53.0
29	0 4.8	0 14.6	0 24.5	0 34.3	0 44.2	0 54.0	1 3.9	1 13.8	1 23.6	1 33.5	1 43.3	1 53.2
30	0 4.9	0 14.8	0 24.6	0 34.5	0 44.4	0 54.2	1 4.1	1 13.9	1 23.8	1 33.6	1 43.5	1 53.3
31	0 5.1	0 14.9	0 24.8	0 34.7	0 44.5	0 54.4	1 4.2	1 14.1	1 23.9	1 33.8	1 43.7	1 53.5
32	0 5.3	0 15.1	0 25.0	0 34.8	0 44.7	0 54.5	1 4.4	1 14.3	1 24.1	1 34.0	1 43.8	1 53.7
33	0 5.4	0 15.3	0 25.1	0 35.0	0 44.8	0 54.7	1 4.6	1 14.4	1 24.3	1 34.1	1 44.0	1 53.8
34	0 5.6	0 15.4	0 25.3	0 35.2	0 45.0	0 54.9	1 4.7	1 14.6	1 24.4	1 34.3	1 44.2	1 54.0
35	0 5.8	0 15.6	0 25.5	0 35.3	0 45.2	0 55.0	1 4.9	1 14.7	1 24.6	1 34.5	1 44.3	1 54.2
36	0 5.9	0 15.8	0 25.6	0 35.5	0 45.3	0 55.2	1 5.1	1 14.9	1 24.8	1 34.6	1 44.5	1 54.3
37	0 6.1	0 15.9	0 25.8	0 35.6	0 45.5	0 55.4	1 5.2	1 15.1	1 24.9	1 34.8	1 44.6	1 54.5
38	0 6.2	0 16.1	0 26.0	0 35.8	0 45.7	0 55.5	1 5.4	1 15.2	1 25.1	1 35.0	1 44.8	1 54.7
39	0 6.4	0 16.3	0 26.1	0 36.0	0 45.8	0 55.7	1 5.5	1 15.4	1 25.3	1 35.1	1 45.0	1 54.8
40	0 6.6	0 16.4	0 26.3	0 36.1	0 46.0	0 55.9	1 5.7	1 15.6	1 25.4	1 35.3	1 45.1	1 55.0
41	0 6.7	0 16.6	0 26.4	0 36.3	0 46.2	0 56.0	1 5.9	1 15.7	1 25.6	1 35.4	1 45.3	1 55.2
42	0 6.9	0 16.8	0 26.6	0 36.5	0 46.3	0 56.2	1 6.0	1 15.9	1 25.8	1 35.6	1 45.5	1 55.3
43	0 7.1	0 16.9	0 26.8	0 36.6	0 46.5	0 56.3	1 6.2	1 16.1	1 25.9	1 35.8	1 45.6	1 55.5
44	0 7.2	0 17.1	0 26.9	0 36.8	0 46.7	0 56.5	1 6.4	1 16.2	1 26.1	1 35.9	1 45.8	1 55.6
45	0 7.4	0 17.2	0 27.1	0 37.0	0 46.8	0 56.7	1 6.5	1 16.4	1 26.2	1 36.1	1 46.0	1 55.8
46	0 7.6	0 17.4	0 27.3	0 37.1	0 47.0	0 56.8	1 6.7	1 16.6	1 26.4	1 36.3	1 46.1	1 56.0
47	0 7.7	0 17.6	0 27.4	0 37.3	0 47.1	0 57.0	1 6.9	1 16.7	1 26.6	1 36.4	1 46.3	1 56.1
48	0 7.9	0 17.7	0 27.6	0 37.5	0 47.3	0 57.2	1 7.0	1 16.9	1 26.7	1 36.6	1 46.4	1 56.3
49	0 8.0	0 17.9	0 27.8	0 37.6	0 47.5	0 57.3	1 7.2	1 17.0	1 26.9	1 36.8	1 46.6	1 56.5
50	0 8.2	0 18.1	0 27.9	0 37.8	0 47.6	0 57.5	1 7.4	1 17.2	1 27.1	1 36.9	1 46.8	1 56.6
51	0 8.4	0 18.2	0 28.1	0 37.9	0 47.8	0 57.7	1 7.5	1 17.4	1 27.2	1 37.1	1 46.9	1 56.8
52	0 8.5	0 18.4	0 28.3	0 38.1	0 48.0	0 57.8	1 7.7	1 17.5	1 27.4	1 37.3	1 47.1	1 57.0
53	0 8.7	0 18.6	0 28.4	0 38.3	0 48.1	0 58.0	1 7.8	1 17.7	1 27.6	1 37.4	1 47.3	1 57.1
54	0 8.9	0 18.7	0 28.6	0 38.4	0 48.3	0 58.2	1 8.0	1 17.9	1 27.7	1 37.6	1 47.4	1 57.3
55	0 9.0	0 18.9	0 28.7	0 38.6	0 48.5	0 58.3	1 8.2	1 18.0	1 27.9	1 37.7	1 47.6	1 57.5
56	0 9.2	0 19.1	0 28.9	0 38.8	0 48.6	0 58.5	1 8.3	1 18.2	1 28.1	1 37.9	1 47.8	1 57.6
57	0 9.4	0 19.2	0 29.1	0 38.9	0 48.8	0 58.6	1 8.5	1 18.4	1 28.2	1 38.1	1 47.9	1 57.8
58	0 9.5	0 19.4	0 29.2	0 39.1	0 49.0	0 58.8	1 8.7	1 18.5	1 28.4	1 38.2	1 48.1	1 57.9
59	0 9.7	0 19.5	0 29.4	0 39.3	0 49.1	0 59.0	1 8.8	1 18.7	1 28.5	1 38.4	1 48.3	1 58.1

MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	12h	13h	14h	15h	16h	17h	18h	19h	20h	21h	22h	23h
m	m s.	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
0	1 58.3	2 8.1	2 18.0	2 27.8	2 37.7	2 47.6	2 57.4	3 7.3	3 17.1	3 27.0	3 36.8	3 46.7
1	1 58.4	2 8.3	2 18.2	2 28.0	2 37.9	2 47.7	2 57.6	3 7.4	3 17.3	3 27.2	3 37.0	3 46.9
2	1 58.6	2 8.5	2 18.3	2 28.2	2 38.0	2 47.9	2 57.7	3 7.6	3 17.5	3 27.3	3 37.2	3 47.0
3	1 58.8	2 8.6	2 18.5	2 28.3	2 38.2	2 48.1	2 57.9	3 7.8	3 17.6	3 27.5	3 37.3	3 47.2
4	1 58.9	2 8.8	2 18.6	2 28.5	2 38.4	2 48.2	2 58.1	3 7.9	3 17.8	3 27.6	3 37.5	3 47.4
5	1 59.1	2 9.0	2 18.8	2 28.7	2 38.5	2 48.4	2 58.2	3 8.1	3 18.0	3 27.8	3 37.7	3 47.5
6	1 59.3	2 9.1	2 19.0	2 28.8	2 38.7	2 48.5	2 58.4	3 8.3	3 18.1	3 28.0	3 37.8	3 47.7
7	1 59.4	2 9.3	2 19.1	2 29.0	2 38.9	2 48.7	2 58.6	3 8.4	3 18.3	3 28.1	3 38.0	3 47.8
8	1 59.6	2 9.4	2 19.3	2 29.2	2 39.0	2 48.9	2 58.7	3 8.6	3 18.4	3 28.3	3 38.2	3 48.0
9	1 59.8	2 9.6	2 19.5	2 29.3	2 39.2	2 49.0	2 58.9	3 8.8	3 18.6	3 28.5	3 38.3	3 48.2
10	1 59.9	2 9.8	2 19.6	2 29.5	2 39.3	2 49.2	2 59.1	3 8.9	3 18.8	3 28.6	3 38.5	3 48.3
11	2 0.1	2 9.9	2 19.8	2 29.7	2 39.5	2 49.4	2 59.2	3 9.1	3 18.9	3 28.8	3 38.6	3 48.5
12	2 0.2	2 10.1	2 20.0	2 29.8	2 39.7	2 49.5	2 59.4	3 9.2	3 19.1	3 29.0	3 38.8	3 48.7
13	2 0.4	2 10.3	2 20.1	2 30.0	2 39.8	2 49.7	2 59.6	3 9.4	3 19.3	3 29.1	3 39.0	3 48.8
14	2 0.6	2 10.4	2 20.3	2 30.1	2 40.0	2 49.9	2 59.7	3 9.6	3 19.4	3 29.3	3 39.1	3 49.0
15	2 0.7	2 10.6	2 20.5	2 30.3	2 40.2	2 50.0	2 59.9	3 9.7	3 19.6	3 29.4	3 39.3	3 49.2
16	2 0.9	2 10.8	2 20.6	2 30.5	2 40.3	2 50.2	3 0.0	3 9.9	3 19.8	3 29.6	3 39.5	3 49.3
17	2 1.1	2 10.9	2 20.8	2 30.6	2 40.5	2 50.4	3 0.2	3 10.1	3 19.9	3 29.8	3 39.6	3 49.5
18	2 1.2	2 11.1	2 20.9	2 30.8	2 40.7	2 50.5	3 0.4	3 10.2	3 20.1	3 29.9	3 39.8	3 49.7
19	2 1.4	2 11.3	2 21.1	2 31.0	2 40.8	2 50.7	3 0.5	3 10.4	3 20.3	3 30.1	3 40.0	3 49.8
20	2 1.6	2 11.4	2 21.3	2 31.1	2 41.0	2 50.8	3 0.7	3 10.6	3 20.4	3 30.3	3 40.1	3 50.0
21	2 1.7	2 11.6	2 21.4	2 31.3	2 41.2	2 51.0	3 0.9	3 10.7	3 20.6	3 30.4	3 40.3	3 50.1
22	2 1.9	2 11.7	2 21.6	2 31.5	2 41.3	2 51.2	3 1.0	3 10.9	3 20.7	3 30.6	3 40.5	3 50.3
23	2 2.1	2 11.9	2 21.8	2 31.6	2 41.5	2 51.3	3 1.2	3 11.1	3 20.9	3 30.8	3 40.6	3 50.5
24	2 2.2	2 12.1	2 21.9	2 31.8	2 41.6	2 51.5	3 1.4	3 11.2	3 21.1	3 30.9	3 40.8	3 50.6
25	2 2.4	2 12.2	2 22.1	2 32.0	2 41.8	2 51.7	3 1.5	3 11.4	3 21.2	3 31.1	3 40.9	3 50.8
26	2 2.5	2 12.4	2 22.3	2 32.1	2 42.0	2 51.8	3 1.7	3 11.5	3 21.4	3 31.3	3 41.1	3 51.0
27	2 2.7	2 12.6	2 22.4	2 32.3	2 42.1	2 52.0	3 1.9	3 11.7	3 21.6	3 31.4	3 41.3	3 51.1
28	2 2.9	2 12.7	2 22.6	2 32.4	2 42.3	2 52.2	3 2.0	3 11.9	3 21.7	3 31.6	3 41.4	3 51.3
29	2 3.0	2 12.9	2 22.8	2 32.6	2 42.5	2 52.3	3 2.2	3 12.0	3 21.9	3 31.8	3 41.6	3 51.5
30	2 3.2	2 13.1	2 22.9	2 32.8	2 42.6	2 52.5	3 2.3	3 12.2	3 22.1	3 31.9	3 41.8	3 51.6
31	2 3.4	2 13.2	2 23.1	2 32.9	2 42.8	2 52.7	3 2.5	3 12.4	3 22.2	3 32.1	3 41.9	3 51.8
32	2 3.5	2 13.4	2 23.2	2 33.1	2 43.0	2 52.8	3 2.7	3 12.5	3 22.4	3 32.2	3 42.1	3 52.0
33	2 3.7	2 13.6	2 23.4	2 33.3	2 43.1	2 53.0	3 2.8	3 12.7	3 22.6	3 32.4	3 42.3	3 52.1
34	2 3.9	2 13.7	2 23.6	2 33.4	2 43.3	2 53.1	3 3.0	3 12.9	3 22.7	3 32.6	3 42.4	3 52.3
35	2 4.0	2 13.9	2 23.7	2 33.6	2 43.5	2 53.3	3 3.2	3 13.0	3 22.9	3 32.7	3 42.6	3 52.4
36	2 4.2	2 14.0	2 23.9	2 33.8	2 43.6	2 53.5	3 3.3	3 13.2	3 23.0	3 32.9	3 42.8	3 52.6
37	2 4.4	2 14.2	2 24.1	2 33.9	2 43.8	2 53.6	3 3.5	3 13.4	3 23.2	3 33.1	3 42.9	3 52.8
38	2 4.5	2 14.4	2 24.2	2 34.1	2 43.9	2 53.8	3 3.7	3 13.5	3 23.4	3 33.2	3 43.1	3 52.9
39	2 4.7	2 14.5	2 24.4	2 34.3	2 44.1	2 54.0	3 3.8	3 13.7	3 23.5	3 33.4	3 43.2	3 53.1
40	2 4.8	2 14.7	2 24.6	2 34.4	2 44.3	2 54.1	3 4.0	3 13.8	3 23.7	3 33.6	3 43.4	3 53.3
41	2 5.0	2 14.9	2 24.7	2 34.6	2 44.4	2 54.3	3 4.2	3 14.0	3 23.9	3 33.7	3 43.6	3 53.4
42	2 5.2	2 15.0	2 24.9	2 34.7	2 44.6	2 54.5	3 4.3	3 14.2	3 24.0	3 33.9	3 43.7	3 53.6
43	2 5.3	2 15.2	2 25.1	2 34.9	2 44.8	2 54.6	3 4.5	3 14.3	3 24.2	3 34.0	3 43.9	3 53.8
44	2 5.5	2 15.4	2 25.2	2 35.1	2 44.9	2 54.8	3 4.6	3 14.5	3 24.4	3 34.2	3 44.1	3 53.9
45	2 5.7	2 15.5	2 25.4	2 35.2	2 45.1	2 55.0	3 4.8	3 14.7	3 24.5	3 34.4	3 44.2	3 54.1
46	2 5.8	2 15.7	2 25.5	2 35.4	2 45.3	2 55.1	3 5.0	3 14.8	3 24.7	3 34.5	3 44.4	3 54.3
47	2 6.0	2 15.9	2 25.7	2 35.6	2 45.4	2 55.3	3 5.1	3 15.0	3 24.8	3 34.7	3 44.6	3 54.4
48	2 6.2	2 16.0	2 25.9	2 35.7	2 45.6	2 55.4	3 5.3	3 15.2	3 25.0	3 34.9	3 44.7	3 54.6
49	2 6.3	2 16.2	2 26.0	2 35.9	2 45.8	2 55.6	3 5.5	3 15.3	3 25.2	3 35.0	3 44.9	3 54.7
50	2 6.5	2 16.3	2 26.2	2 36.1	2 45.9	2 55.8	3 5.6	3 15.5	3 25.3	3 35.2	3 45.1	3 54.9
51	2 6.7	2 16.5	2 26.4	2 36.2	2 46.1	2 55.9	3 5.8	3 15.7	3 25.5	3 35.4	3 45.2	3 55.1
52	2 6.8	2 16.7	2 26.5	2 36.4	2 46.2	2 56.1	3 6.0	3 15.8	3 25.7	3 35.5	3 45.4	3 55.2
53	2 7.0	2 16.8	2 26.7	2 36.6	2 46.4	2 56.3	3 6.1	3 16.0	3 25.8	3 35.7	3 45.5	3 55.4
54	2 7.1	2 17.0	2 26.9	2 36.7	2 46.6	2 56.4	3 6.3	3 16.1	3 26.0	3 35.9	3 45.7	3 55.6
55	2 7.3	2 17.2	2 27.0	2 36.9	2 46.7	2 56.6	3 6.5	3 16.3	3 26.2	3 36.0	3 45.9	3 55.7
56	2 7.5	2 17.3	2 27.2	2 37.0	2 46.9	2 56.8	3 6.6	3 16.5	3 26.3	3 36.2	3 46.0	3 55.9
57	2 7.6	2 17.5	2 27.4	2 37.2	2 47.1	2 56.9	3 6.8	3 16.6	3 26.5	3 36.4	3 46.2	3 56.1
58	2 7.8	2 17.7	2 27.5	2 37.4	2 47.2	2 57.1	3 6.9	3 16.8	3 26.7	3 36.5	3 46.4	3 56.2
59	2 8.0	2 17.8	2 27.7	2 37.5	2 47.4	2 57.3	3 7.1	3 17.0	3 26.8	3 36.7	3 46.5	3 56.4

TABLE IV.

PROPORTIONAL PARTS.

Interval 2 hours.	0	10	20	30	40	50	60	70	80	90	100	110	120	Interval 24 hours.	
m														h	m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	1	1	1	1	1	1		12
2	0	0	0	0	1	1	1	1	1	2	2	2	2		24
3	0	0	0	1	1	1	2	2	2	2	2	3	3		36
4	0	0	1	1	1	2	2	2	3	3	3	4	4		48
5	0	0	1	1	2	2	2	3	3	4	4	5	5	1	0
6	0	0	1	2	2	2	3	4	4	4	5	6	6		12
7	0	1	1	2	2	3	4	4	5	5	6	6	7		24
8	0	1	1	2	3	3	4	5	5	6	7	7	8		36
9	0	1	2	2	3	4	4	5	6	7	8	8	9		48
10	0	1	2	2	3	4	5	6	7	8	8	9	10	2	0
11	0	1	2	3	4	5	6	6	7	8	9	10	11		12
12	0	1	2	3	4	5	6	7	8	9	10	11	12		24
13	0	1	2	3	4	5	6	8	9	10	11	12	13		36
14	0	1	2	4	5	6	7	8	9	10	12	13	14		48
15	0	1	2	4	5	6	8	9	10	11	12	14	15	3	0
16	0	1	3	4	5	7	8	9	11	12	13	15	16		12
17	0	1	3	4	6	7	8	10	11	13	14	16	17		24
18	0	2	3	4	6	8	9	10	12	14	15	16	18		36
19	0	2	3	5	6	8	10	11	13	14	16	17	19		48
20	0	2	3	5	7	8	10	12	13	15	17	18	20	4	0
21	0	2	4	5	7	9	10	12	14	16	18	19	21		12
22	0	2	4	6	7	9	11	13	15	16	18	20	22		24
23	0	2	4	6	8	10	12	13	15	17	19	21	23		36
24	0	2	4	6	8	10	12	14	16	18	20	22	24		48
25	0	2	4	6	8	10	12	15	17	19	21	23	25	5	0
26	0	2	4	6	9	11	13	15	17	20	22	24	26		12
27	0	2	4	7	9	11	14	16	18	20	22	25	27		24
28	0	2	5	7	9	12	14	16	19	21	23	26	28		36
29	0	2	5	7	10	12	14	17	19	22	24	27	29		48
30	0	2	5	8	10	12	15	18	20	22	25	28	30	6	0
31	0	3	5	8	10	13	16	18	21	23	26	28	31		12
32	0	3	5	8	11	13	16	19	21	24	27	29	32		24
33	0	3	6	8	11	14	16	19	22	25	28	30	33		36
34	0	3	6	8	11	14	17	20	23	26	28	31	34		48
35	0	3	6	9	12	15	18	20	23	26	29	32	35	7	0
36	0	3	6	9	12	15	18	21	24	27	30	33	36		12
37	0	3	6	9	12	15	18	22	25	28	31	34	37		24
38	0	3	6	10	13	16	19	22	25	28	32	35	38		36
39	0	3	6	10	13	16	20	23	26	29	32	36	39		48
40	0	3	7	10	13	17	20	23	27	30	33	37	40	8	0
41	0	3	7	10	14	17	20	24	27	31	34	38	41		12
42	0	4	7	10	14	18	21	24	28	32	35	38	42		24
43	0	4	7	11	14	18	22	25	29	32	36	39	43		36
44	0	4	7	11	15	18	22	26	29	33	37	40	44		48
45	0	4	8	11	15	19	22	26	30	34	38	41	45	9	0
46	0	4	8	12	15	19	23	27	31	34	38	42	46		12
47	0	4	8	12	16	20	24	27	31	35	39	43	47		24
48	0	4	8	12	16	20	24	28	32	36	40	44	48		36
49	0	4	8	12	16	20	24	29	33	37	41	45	49		48
50	0	4	8	12	17	21	25	29	33	38	42	46	50	10	0
51	0	4	8	13	17	21	26	30	34	38	42	47	51		12
52	0	4	9	13	17	22	26	30	35	39	43	48	52		24
53	0	4	9	13	18	22	26	31	35	40	44	49	53		36
54	0	4	9	14	18	22	27	32	36	40	45	50	54		48
55	0	5	9	14	18	23	28	32	37	41	46	50	55	11	0
56	0	5	9	14	19	23	28	33	37	42	47	51	56		12
57	0	5	10	14	19	24	28	33	38	43	48	52	57		24
58	0	5	10	14	19	24	29	34	39	44	48	53	58		36
59	0	5	10	15	20	25	30	34	39	44	49	54	59		48
60	0	5	10	15	20	25	30	35	40	45	50	55	60	12	0

PROPORTIONAL PARTS.

Interval 2 hours.	120	130	140	150	160	170	180	190	200	210	220	230	240	Interval 24 hours.
m														h m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0
1	1	1	1	1	1	1	2	2	2	2	2	2	2	12
2	2	2	2	2	3	3	3	3	3	4	4	4	4	24
3	3	3	4	4	4	4	4	5	5	5	6	6	6	36
4	4	4	5	5	5	6	6	6	7	7	7	8	8	48
5	5	5	6	6	7	7	8	8	8	9	9	10	10	1 0
6	6	6	7	8	8	8	9	10	10	10	11	12	12	12
7	7	8	8	9	9	10	10	11	12	12	13	13	14	24
8	8	9	9	10	11	11	12	13	13	14	15	16	16	36
9	9	10	10	11	12	13	14	14	15	16	16	17	18	48
10	10	11	12	12	13	14	15	16	17	18	18	19	20	2 0
11	11	12	13	14	15	16	16	17	18	19	20	21	22	12
12	12	13	14	15	16	17	18	19	20	21	22	23	24	24
13	13	14	15	16	17	18	20	21	22	23	24	25	26	36
14	14	15	16	18	19	20	21	22	23	24	26	27	28	48
15	15	16	18	19	20	21	22	24	25	26	28	29	30	3 0
16	16	17	19	20	21	23	24	25	27	28	29	31	32	12
17	17	18	20	21	23	24	26	27	28	30	31	33	34	24
18	18	20	21	22	24	26	27	28	30	32	33	34	36	36
19	19	21	22	24	25	27	28	30	32	33	35	36	38	48
20	20	22	23	25	27	28	30	32	33	35	37	38	40	4 0
21	21	23	24	26	28	30	32	33	35	37	38	40	42	12
22	22	24	26	28	29	31	33	35	37	38	40	42	44	24
23	23	25	27	29	31	33	34	36	38	40	42	44	46	36
24	24	26	28	30	32	34	36	38	40	42	44	46	48	48
25	25	27	29	31	33	35	38	40	42	44	46	48	50	5 0
26	26	28	30	32	35	37	39	41	43	46	48	50	52	12
27	27	29	32	34	36	38	40	43	45	47	50	52	54	24
28	28	30	33	35	37	40	42	44	47	49	51	54	56	36
29	29	31	34	36	39	41	44	46	48	51	53	56	58	48
30	30	32	35	38	40	42	45	48	50	52	55	58	60	6 0
31	31	34	36	39	41	44	46	49	52	54	57	59	62	12
32	32	35	37	40	43	45	48	51	53	56	59	61	64	24
33	33	36	38	41	44	47	50	52	55	58	60	63	66	36
34	34	37	40	42	45	48	51	54	57	60	62	65	68	48
35	35	38	41	44	47	50	52	55	58	61	64	67	70	7 0
36	36	39	42	45	48	51	54	57	60	63	66	69	72	12
37	37	40	43	46	49	52	56	59	62	65	68	71	74	24
38	38	41	44	48	51	54	57	60	63	66	70	73	76	36
39	39	42	46	49	52	55	58	62	65	68	72	75	78	48
40	40	43	47	50	53	57	60	63	67	70	73	77	80	8 0
41	41	44	48	51	55	58	62	65	68	72	75	79	82	12
42	42	46	49	52	56	60	63	66	70	74	77	80	84	24
43	43	47	50	54	57	61	64	68	72	75	79	82	86	36
44	44	48	51	55	59	62	66	70	73	77	81	84	88	48
45	45	49	52	56	60	64	68	71	75	79	82	86	90	9 0
46	46	50	54	58	61	65	69	73	77	80	84	88	92	12
47	47	51	55	59	63	67	70	74	78	82	86	90	94	24
48	48	52	56	60	64	68	72	76	80	84	88	92	96	36
49	49	53	57	61	65	69	74	78	82	86	90	94	98	48
50	50	54	58	62	67	71	75	79	83	88	92	96	100	10 0
51	51	55	60	64	68	72	76	81	85	89	94	98	102	12
52	52	56	61	65	69	74	78	82	87	91	95	100	104	24
53	53	57	62	66	71	75	80	84	88	93	97	102	106	36
54	54	58	63	68	72	76	81	86	90	94	99	104	108	48
55	55	60	64	69	73	78	82	87	92	96	101	105	110	11 0
56	56	61	65	70	75	79	84	89	93	98	103	107	112	12
57	57	62	66	71	76	81	86	90	95	100	104	109	114	24
58	58	63	68	72	77	82	87	92	97	102	106	111	116	36
59	59	64	69	74	79	84	88	93	98	103	108	113	118	48
60	60	65	70	75	80	85	90	95	100	105	110	115	120	12 0

PROPORTIONAL PARTS.

Interval 2 hours.	240	250	260	270	280	290	300	310	320	330	340	350	360	Interval 24 hours.
m														h m
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0
1	2	2	2	2	2	2	2	3	3	3	3	3	3	12
2	4	4	4	4	5	5	5	5	5	6	6	6	6	24
3	6	6	6	7	7	7	8	8	8	8	8	9	9	36
4	8	8	9	9	9	10	10	10	11	11	11	12	12	48
5	10	10	11	11	12	12	12	13	13	14	14	15	15	1 0
6	12	12	13	14	14	14	15	16	16	16	17	18	18	12
7	14	15	15	16	16	17	18	18	19	19	20	20	21	24
8	16	17	17	18	19	19	20	21	21	22	23	23	24	36
9	18	19	20	20	21	22	22	23	24	25	26	26	27	48
10	20	21	22	22	23	24	25	26	27	28	28	29	30	2 0
11	22	23	24	25	26	27	28	28	29	30	31	32	33	12
12	24	25	26	27	28	29	30	31	32	33	34	35	36	24
13	26	27	28	29	30	31	32	34	35	36	37	38	39	36
14	28	29	30	32	33	34	35	36	37	38	40	41	42	48
15	30	31	32	34	35	36	38	39	40	41	42	44	45	3 0
16	32	33	35	36	37	39	40	41	43	44	45	47	48	12
17	34	35	37	38	40	41	42	44	45	47	48	50	51	24
18	36	38	39	40	42	44	45	46	48	50	51	52	54	36
19	38	40	41	43	44	46	48	49	51	52	54	55	57	48
20	40	42	43	45	47	48	50	52	53	55	57	58	60	4 0
21	42	44	46	47	49	51	52	54	56	58	60	61	63	12
22	44	46	48	50	51	53	55	57	59	60	62	64	66	24
23	46	48	50	52	54	56	58	59	61	63	65	67	69	36
24	48	50	52	54	56	58	60	62	64	66	68	70	72	48
25	50	52	54	56	58	60	62	65	67	69	71	73	75	5 0
26	52	54	56	58	61	63	65	67	69	72	74	76	78	12
27	54	56	58	61	63	65	68	70	72	74	76	79	81	24
28	56	58	61	63	65	68	70	72	75	77	79	82	84	36
29	58	60	63	65	68	70	72	75	77	80	82	85	87	48
30	60	62	65	68	70	72	75	78	80	82	85	88	90	6 0
31	62	65	67	70	72	75	78	80	83	85	88	90	93	12
32	64	67	69	72	75	77	80	83	85	88	91	93	96	24
33	66	69	72	74	77	80	82	85	88	91	94	96	99	36
34	68	71	74	76	79	82	85	88	91	94	96	99	102	48
35	70	73	76	79	82	85	88	90	93	96	99	102	105	7 0
36	72	75	78	81	84	87	90	93	96	99	102	105	108	12
37	74	77	80	83	86	89	92	96	99	102	105	108	111	24
38	76	79	82	86	89	92	95	98	101	104	108	111	114	36
39	78	81	84	88	91	94	98	101	104	107	110	114	117	48
40	80	83	87	90	93	97	100	103	107	110	113	117	120	8 0
41	82	85	89	92	96	99	102	106	109	113	116	120	123	12
42	84	88	91	94	98	102	105	108	112	116	119	122	126	24
43	86	90	93	97	100	104	108	111	115	118	122	125	129	36
44	88	92	95	99	103	106	110	114	117	121	125	128	132	48
45	90	94	98	101	105	109	112	116	120	124	128	131	135	9 0
46	92	96	100	104	107	111	115	119	123	126	130	134	138	12
47	94	98	102	106	110	114	118	121	125	129	133	137	141	24
48	96	100	104	108	112	116	120	124	128	132	136	140	144	36
49	98	102	106	110	114	118	122	127	131	135	139	143	147	48
50	100	104	108	112	117	121	125	129	133	138	142	146	150	10 0
51	102	106	110	115	119	123	128	132	136	140	144	149	153	12
52	104	108	113	117	121	126	130	134	139	143	147	152	156	24
53	106	110	115	119	124	128	132	137	141	146	150	155	159	36
54	108	112	117	122	126	130	135	140	144	148	153	158	162	48
55	110	115	119	124	128	133	138	142	147	151	156	160	165	11 0
56	112	117	121	126	131	135	140	145	149	154	159	163	168	12
57	114	119	124	128	133	138	142	147	152	157	162	166	171	24
58	116	121	126	130	135	140	145	150	155	160	164	169	174	36
59	118	123	128	133	138	143	148	152	157	162	167	172	177	48
60	120	125	130	135	140	145	150	155	160	165	170	175	180	12 0

FOR OBTAINING APPROXIMATELY THE SOLAR EPHEMERIS FOR ANY YEAR, 1921–1934, FROM THAT FOR 1920.

Year.	Correction.	Year.	Correction.
	h m		h m
1921	− 5 50	1928	+ 1 19
1922	−11 41	1929	− 4 29
1923	−17 32	1930	−10 16
1924	+ 0 37	1931	−16 3
1925	− 5 13	1932	+ 2 10
1926	−11 3	1933	− 3 36
1927	−16 53	1934	− 9 23

For any instant of time in 1921 to 1934, proceed as follows:

1. Reduce the local mean time to Greenwich mean time.
2. To this G. M. T. apply the correction found opposite to the given year in the above table.
3. If the given month be January or February of a common year (not a leap year), apply a further correction by adding one day.
4. With the time thus corrected, take out from pages 2–29 of this Almanac the several quantities relating to the Sun.

Example.—Find the right Ascension of the Mean Sun, the Equation of Time, the Sun's Declination, and the Sun's Semidiameter for Feb 8, 1921, 1 p. m., local mean time, at a place whose longitude is 45°, or 3h, west of Greenwich.

	d h m
Local astronomical mean time	Feb. 8 1 0
Longitude from Greenwich	+ 3 0
Greenwich Mean Time	Feb. 8 4 0
Correction for 1921	−0 5 50
Correction for January and February of a common year	+1 0 0
Corrected time for use with 1920 Almanac	Feb 8 22 10

On pages 2, 3, 8, and 9, for the corected time, the following values are found:

	h m s
Right Ascension of the Mean Sun	21 12 51.3
Equation of Time	−14 20.4
	° ′
Sun's Declination	−15 1.0
	′
Sun's Semidinmeter	16.2

NOTE.—The above method neglects entirely the change in the longitude of the perihelion of the earth's orbit and that in the perturbations by the planets, and therefore should not be used when an Almanac of date can be obtained.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 20	20 32	20 46	21 3
1	18 0	18 17	18 35	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 32	20 46	21 3
2	18 0	18 17	18 36	18 56	19 8	19 22	19 39	19 59	20 8	20 19	20 31	20 46	21 2
3	18 1	18 18	18 36	18 57	19 9	19 22	19 39	19 59	20 8	20 19	20 31	20 45	21 2
4	18 1	18 18	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 19	20 31	20 45	21 1
5	18 2	18 18	18 36	18 57	19 9	19 22	19 38	19 58	20 8	20 18	20 30	20 44	21 0
6	18 2	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 18	20 30	20 43	20 59
7	18 3	18 19	18 37	18 57	19 9	19 22	19 38	19 58	20 7	20 17	20 29	20 43	20 58
8	18 3	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 17	20 28	20 42	20 58
9	18 3	18 20	18 37	18 57	19 9	19 22	19 38	19 57	20 6	20 16	20 28	20 41	20 56
10	18 4	18 20	18 37	18 57	19 9	19 22	19 37	19 56	20 5	20 15	20 27	20 40	20 55
11	18 4	18 20	18 38	18 57	19 9	19 22	19 37	19 56	20 5	20 15	20 26	20 39	20 54
12	18 5	18 21	18 38	18 57	19 9	19 21	19 37	19 55	20 4	20 14	20 25	20 38	20 53
13	18 5	18 21	18 38	18 57	19 8	19 21	19 36	19 55	20 3	20 13	20 24	20 37	20 51
14	18 5	18 21	18 38	18 58	19 8	19 21	19 36	19 54	20 3	20 12	20 23	20 35	20 50
15	18 6	18 21	18 38	18 57	19 8	19 20	19 35	19 53	20 2	20 11	20 22	20 34	20 49
16	18 6	18 22	18 38	18 57	19 8	19 20	19 35	19 52	20 1	20 10	20 21	20 33	20 47
17	18 7	18 22	18 38	18 57	19 7	19 20	19 34	19 52	20 0	20 9	20 20	20 31	20 45
18	18 7	18 22	18 38	18 56	19 7	19 19	19 33	19 51	19 59	20 8	20 18	20 30	20 44
19	18 7	18 22	18 38	18 56	19 7	19 19	19 33	19 50	19 58	20 7	20 17	20 29	20 42
20	18 8	18 22	18 38	18 56	19 6	19 18	19 32	19 49	19 57	20 6	20 15	20 27	20 40
21	18 8	18 22	18 38	18 56	19 6	19 17	19 31	19 48	19 56	20 4	20 14	20 25	20 38
22	18 8	18 23	18 38	18 55	19 5	19 17	19 30	19 47	19 55	20 3	20 13	20 24	20 36
23	18 8	18 23	18 38	18 55	19 5	19 16	19 30	19 46	19 53	20 2	20 11	20 22	20 34
24	18 9	18 23	18 38	18 55	19 4	19 16	19 29	19 45	19 52	20 0	20 10	20 20	20 33
25	18 9	18 23	18 37	18 54	19 4	19 15	19 28	19 43	19 51	19 59	20 8	20 19	20 30
26	18 9	18 23	18 37	18 54	19 3	19 14	19 27	19 42	19 49	19 57	20 6	20 17	20 28
27	18 9	18 23	18 37	18 53	19 3	19 13	19 26	19 41	19 48	19 56	20 5	20 15	20 26
28	18 9	18 23	18 37	18 53	19 2	19 13	19 25	19 40	19 47	19 54	20 3	20 13	20 24
29	18 10	18 23	18 37	18 52	19 1	19 12	19 24	19 38	19 45	19 53	20 1	20 11	20 22
30	18 10	18 23	18 36	18 52	19 1	19 11	19 23	19 37	19 44	19 51	19 59	20 9	20 20
31	18 10	18 23	18 36	18 51	19 0	19 10	19 22	19 36	19 42	19 50	19 58	20 7	20 17
Feb. 1	18 10	18 23	18 36	18 51	18 59	19 9	19 21	19 34	19 41	19 48	19 56	20 5	20 15
2	18 10	18 22	18 35	18 50	18 59	19 8	19 19	19 33	19 39	19 46	19 54	20 3	20 13
3	18 10	18 22	18 35	18 50	18 58	19 7	19 18	19 32	19 38	19 44	19 52	20 1	20 10
4	18 10	18 22	18 35	18 49	18 57	19 6	19 17	19 30	19 36	19 42	19 50	19 58	20 8
5	18 10	18 22	18 34	18 48	18 56	19 5	19 16	19 28	19 34	19 41	19 48	19 56	20 5
6	18 11	18 22	18 34	18 47	18 55	19 4	19 14	19 27	19 33	19 39	19 46	19 54	20 3
7	18 11	18 22	18 34	18 47	18 54	19 3	19 13	19 25	19 31	19 37	19 44	19 52	20 0
8	18 11	18 21	18 33	18 46	18 53	19 2	19 12	19 24	19 29	19 35	19 42	19 49	19 58
9	18 11	18 21	18 33	18 45	18 52	19 1	19 10	19 22	19 27	19 33	19 40	19 47	19 55
10	18 11	18 21	18 32	18 44	18 52	19 0	19 9	19 20	19 25	19 31	19 37	19 45	19 53
11	18 11	18 21	18 32	18 44	18 51	18 58	19 8	19 18	19 24	19 29	19 35	19 42	19 50
12	18 11	18 21	18 31	18 43	18 50	18 57	19 6	19 17	19 22	19 27	19 33	19 40	19 47
13	18 11	18 20	18 31	18 42	18 49	18 56	19 5	19 15	19 20	19 25	19 31	19 37	19 45
14	18 11	18 20	18 30	18 41	18 48	18 55	19 3	19 13	19 18	19 23	19 29	19 35	19 42
15	18 11	18 20	18 30	18 40	18 47	18 53	19 2	19 11	19 16	19 21	19 26	19 32	19 39

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 1	6 7	5 50	5 32	5 11	4 59	4 45	4 28	4 8	3 58	3 47	3 35	3 21	3 4
2	6 7	5 50	5 32	5 11	4 59	4 45	4 29	4 9	3 59	3 48	3 36	3 22	3 5
3	6 8	5 51	5 33	5 12	5 0	4 46	4 30	4 10	4 0	3 49	3 37	3 23	3 6
4	6 8	5 51	5 34	5 13	5 1	4 47	4 31	4 11	4 1	3 51	3 39	3 25	3 8
5	6 9	5 52	5 34	5 14	5 2	4 48	4 32	4 12	4 3	3 52	3 40	3 26	3 10
6	6 9	5 53	5 35	5 14	5 2	4 49	4 33	4 13	4 4	3 53	3 41	3 28	3 11
7	6 10	5 53	5 35	5 15	5 3	4 50	4 34	4 14	4 5	3 55	3 43	3 29	3 13
8	6 10	5 54	5 36	5 16	5 4	4 51	4 35	4 16	4 6	3 56	3 44	3 31	3 15
9	6 11	5 54	5 37	5 17	5 5	4 52	4 36	4 17	4 8	3 57	3 46	3 32	3 17
10	6 11	5 55	5 37	5 17	5 6	4 53	4 37	4 18	4 9	3 59	3 47	3 34	3 19
11	6 11	5 55	5 38	5 18	5 7	4 54	4 38	4 19	4 10	4 0	3 49	3 36	3 21
12	6 12	5 56	5 39	5 19	5 8	4 55	4 39	4 21	4 12	4 2	3 51	3 38	3 23
13	6 12	5 56	5 39	5 20	5 9	4 56	4 41	4 22	4 13	4 4	3 52	3 40	3 25
14	6 12	5 57	5 40	5 21	5 10	4 57	4 42	4 24	4 15	4 5	3 54	3 42	3 27
15	6 13	5 57	5 41	5 22	5 11	4 58	4 43	4 25	4 16	4 7	3 56	3 44	3 29
16	6 13	5 58	5 41	5 22	5 11	4 59	4 44	4 26	4 18	4 8	3 58	3 46	3 31
17	6 14	5 58	5 42	5 23	5 12	5 0	4 46	4 28	4 19	4 10	4 0	3 48	3 34
18	6 14	5 59	5 43	5 24	5 13	5 1	4 47	4 29	4 21	4 12	4 2	3 50	3 36
19	6 14	5 59	5 43	5 25	5 14	5 2	4 48	4 31	4 23	4 14	4 3	3 52	3 38
20	6 14	6 0	5 44	5 26	5 15	5 4	4 50	4 33	4 24	4 16	4 5	3 54	3 41
21	6 15	6 0	5 45	5 27	5 16	5 5	4 51	4 34	4 26	4 17	4 7	3 56	3 43
22	6 15	6 0	5 45	5 28	5 17	5 6	4 52	4 36	4 28	4 19	4 9	3 58	3 46
23	6 15	6 1	5 46	5 28	5 18	5 7	4 54	4 37	4 29	4 21	4 11	4 1	3 48
24	6 16	6 1	5 46	5 29	5 20	5 8	4 55	4 39	4 31	4 23	4 14	4 3	3 51
25	6 16	6 2	5 47	5 30	5 20	5 9	4 56	4 40	4 33	4 25	4 16	4 5	3 53
26	6 16	6 2	5 48	5 31	5 22	5 11	4 58	4 42	4 35	4 27	4 18	4 7	3 56
27	6 16	6 3	5 48	5 32	5 23	5 12	4 59	4 44	4 37	4 29	4 20	4 10	3 58
28	6 17	6 3	5 49	5 33	5 24	5 13	5 1	4 45	4 38	4 31	4 22	4 12	4 1
29	6 17	6 4	5 50	5 34	5 25	5 14	5 2	4 47	4 40	4 33	4 24	4 14	4 3
30	6 17	6 4	5 50	5 35	5 26	5 15	5 3	4 49	4 42	4 35	4 26	4 17	4 6
31	6 17	6 4	5 51	5 35	5 27	5 16	5 5	4 50	4 44	4 37	4 28	4 19	4 8
Feb. 1	6 17	6 5	5 51	5 36	5 28	5 18	5 6	4 52	4 46	4 39	4 30	4 21	4 11
2	6 17	6 5	5 52	5 37	5 29	5 19	5 8	4 54	4 48	4 41	4 33	4 24	4 14
3	6 17	6 5	5 53	5 38	5 30	5 20	5 9	4 56	4 49	4 43	4 35	4 26	4 16
4	6 18	6 6	5 53	5 39	5 31	5 21	5 10	4 57	4 51	4 45	4 37	4 29	4 19
5	6 18	6 6	5 54	5 40	5 32	5 22	5 12	4 59	4 53	4 47	4 39	4 31	4 22
6	6 18	6 6	5 54	5 40	5 33	5 24	5 13	5 1	4 55	4 49	4 41	4 33	4 24
7	6 18	6 7	5 55	5 41	5 34	5 25	5 15	5 2	4 57	4 51	4 44	4 36	4 27
8	6 18	6 7	5 55	5 42	5 35	5 26	5 16	5 4	4 59	4 53	4 46	4 38	4 29
9	6 18	6 7	5 56	5 43	5 36	5 27	5 18	5 6	5 1	4 55	4 48	4 40	4 32
10	6 18	6 7	5 56	5 44	5 37	5 29	5 19	5 8	5 2	4 57	4 50	4 43	4 35
11	6 18	6 8	5 57	5 45	5 38	5 30	5 20	5 9	5 4	4 59	4 52	4 45	4 37
12	6 18	6 8	5 57	5 45	5 39	5 31	5 22	5 11	5 6	5 1	4 55	4 48	4 40
13	6 18	6 8	5 58	5 46	5 40	5 32	5 23	5 13	5 8	5 3	4 57	4 50	4 43
14	6 18	6 8	5 58	5 47	5 41	5 33	5 25	5 14	5 10	5 5	4 59	4 52	4 45
15	6 18	6 9	5 59	5 48	5 42	5 34	5 26	5 16	5 12	5 7	5 1	4 55	4 48
16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 3	4 57	4 51

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 15	18 11	18 20	18 30	18 40	18 47	18 53	19 2	19 11	19 16	19 21	19 26	19 32	19 39
16	18 11	18 20	18 29	18 39	18 46	18 52	19 0	19 10	19 14	19 19	19 24	19 30	19 37
17	18 11	18 19	18 28	18 39	18 44	18 51	18 59	19 8	19 12	19 17	19 22	19 27	19 34
18	18 11	18 19	18 28	18 38	18 43	18 50	18 57	19 6	19 10	19 14	19 19	19 25	19 31
19	18 11	18 19	18 27	18 37	18 42	18 48	18 56	19 4	19 8	19 12	19 17	19 22	19 28
20	18 10	18 18	18 26	18 36	18 41	18 47	18 54	19 2	19 6	19 10	19 15	19 20	19 26
21	18 10	18 18	18 26	18 35	18 40	18 45	18 52	19 0	19 4	19 8	19 12	19 17	19 23
22	18 10	18 18	18 25	18 34	18 39	18 44	18 51	18 58	19 2	19 6	19 10	19 15	19 20
23	18 10	18 17	18 24	18 33	18 38	18 43	18 49	18 56	19 0	19 3	19 7	19 12	19 17
24	18 10	18 17	18 24	18 32	18 36	18 41	18 47	18 54	18 58	19 1	19 5	19 9	19 14
25	18 10	18 16	18 23	18 31	18 35	18 40	18 46	18 52	18 55	18 59	19 3	19 7	19 11
26	18 10	18 16	18 22	18 30	18 34	18 38	18 44	18 50	18 53	18 56	19 0	19 4	19 8
27	18 10	18 16	18 22	18 29	18 33	18 37	18 42	18 48	18 51	18 54	18 58	19 1	19 6
28	18 9	18 15	18 21	18 28	18 31	18 35	18 41	18 46	18 49	18 52	18 55	18 59	19 3
29	18 9	18 15	18 20	18 26	18 30	18 34	18 39	18 44	18 47	18 50	18 53	18 56	19 0
Mar. 1	18 9	18 14	18 19	18 25	18 29	18 33	18 37	18 42	18 45	18 47	18 50	18 53	18 57
2	18 9	18 14	18 19	18 24	18 28	18 31	18 35	18 40	18 42	18 45	18 48	18 50	18 54
3	18 9	18 13	18 18	18 23	18 26	18 30	18 34	18 38	18 40	18 42	18 45	18 48	18 51
4	18 8	18 13	18 17	18 22	18 25	18 28	18 32	18 36	18 38	18 40	18 42	18 45	18 48
5	18 8	18 12	18 16	18 21	18 24	18 26	18 30	18 34	18 36	18 38	18 40	18 42	18 45
6	18 8	18 12	18 15	18 20	18 22	18 25	18 28	18 32	18 33	18 35	18 37	18 40	18 42
7	18 8	18 11	18 15	18 19	18 21	18 23	18 26	18 30	18 31	18 33	18 35	18 37	18 39
8	18 7	18 11	18 14	18 18	18 20	18 22	18 25	18 28	18 29	18 30	18 32	18 34	18 37
9	18 7	18 10	18 13	18 16	18 18	18 20	18 23	18 25	18 27	18 28	18 30	18 31	18 33
10	18 7	18 10	18 12	18 15	18 17	18 19	18 21	18 23	18 24	18 26	18 27	18 28	18 30
11	18 7	18 9	18 11	18 14	18 16	18 17	18 19	18 21	18 22	18 23	18 24	18 26	18 27
12	18 6	18 8	18 10	18 13	18 14	18 16	18 17	18 19	18 20	18 21	18 22	18 23	18 24
13	18 6	18 8	18 10	18 12	18 13	18 14	18 15	18 17	18 17	18 18	18 19	18 20	18 21
14	18 6	18 7	18 9	18 10	18 11	18 12	18 13	18 15	18 15	18 16	18 16	18 17	18 18
15	18 5	18 7	18 8	18 9	18 10	18 11	18 12	18 12	18 13	18 13	18 14	18 14	18 15
16	18 5	18 6	18 7	18 8	18 9	18 9	18 10	18 10	18 11	18 11	18 11	18 12	18 12
17	18 5	18 6	18 6	18 7	18 7	18 8	18 8	18 8	18 8	18 8	18 9	18 9	18 9
18	18 5	18 5	18 5	18 6	18 6	18 6	18 6	18 6	18 6	18 6	18 6	18 6	18 6
19	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 4	18 3	18 3	18 3	18 3
20	18 4	18 4	18 4	18 3	18 3	18 3	18 2	18 2	18 1	18 1	18 1	18 0	18 0
21	18 4	18 3	18 3	18 2	18 2	18 1	18 0	17 59	17 59	17 58	17 58	17 58	17 57
22	18 3	18 3	18 2	18 1	18 0	17 59	17 58	17 57	17 57	17 56	17 55	17 55	17 54
23	18 3	18 2	18 1	18 0	17 59	17 58	17 57	17 55	17 54	17 54	17 53	17 52	17 51
24	18 3	18 2	18 0	17 58	17 57	17 56	17 55	17 53	17 52	17 51	17 50	17 49	17 48
25	18 2	18 1	17 59	17 57	17 56	17 55	17 53	17 51	17 50	17 49	17 48	17 46	17 45
26	18 2	18 0	17 58	17 56	17 55	17 53	17 51	17 48	17 47	17 46	17 45	17 43	17 42
27	18 2	18 0	17 57	17 55	17 53	17 51	17 49	17 46	17 45	17 44	17 42	17 40	17 39
28	18 2	17 59	17 57	17 53	17 52	17 50	17 47	17 44	17 43	17 41	17 39	17 38	17 36
29	18 1	17 59	17 56	17 52	17 50	17 48	17 45	17 42	17 41	17 39	17 37	17 35	17 33
30	18 1	17 58	17 55	17 51	17 49	17 46	17 43	17 40	17 38	17 36	17 34	17 32	17 30
31	18 1	17 58	17 54	17 50	17 48	17 45	17 42	17 38	17 36	17 34	17 32	17 29	17 26
Apr. 1	18 0	17 57	17 53	17 49	17 46	17 43	17 40	17 35	17 34	17 31	17 29	17 26	17 23

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

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For sunset in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	6 18	6 9	5 59	5 49	5 43	5 36	5 28	5 18	5 14	5 9	5 3	4 57	4 51
17	6 18	6 9	6 0	5 49	5 43	5 37	5 29	5 20	5 15	5 11	5 5	5 0	4 53
18	6 18	6 9	6 0	5 50	5 45	5 38	5 30	5 21	5 17	5 13	5 8	5 2	4 56
19	6 18	6 9	6 1	5 51	5 45	5 39	5 32	5 23	5 19	5 15	5 10	5 4	4 58
20	6 17	6 9	6 1	5 52	5 46	5 40	5 33	5 25	5 21	5 17	5 12	5 7	5 1
21	6 17	6 10	6 2	5 52	5 47	5 41	5 35	5 26	5 23	5 19	5 14	5 9	5 4
22	6 17	6 10	6 2	5 53	5 48	5 43	5 36	5 28	5 25	5 21	5 16	5 12	5 6
23	6 17	6 10	6 2	5 54	5 49	5 44	5 37	5 30	5 27	5 23	5 19	5 14	5 9
24	6 17	6 10	6 3	5 55	5 50	5 45	5 39	5 32	5 28	5 25	5 21	5 16	5 11
25	6 17	6 10	6 3	5 55	5 51	5 46	5 40	5 33	5 30	5 27	5 23	5 18	5 14
26	6 17	6 10	6 4	5 56	5 52	5 47	5 42	5 35	5 32	5 29	5 25	5 21	5 16
27	6 16	6 10	6 4	5 57	5 53	5 48	5 43	5 37	5 34	5 31	5 27	5 23	5 19
28	6 16	6 10	6 4	5 58	5 54	5 49	5 44	5 38	5 36	5 33	5 29	5 26	5 22
29	6 16	6 11	6 5	5 58	5 55	5 50	5 46	5 40	5 38	5 35	5 31	5 28	5 24
Mar. 1	6 16	6 11	6 5	5 59	5 56	5 52	5 47	5 42	5 39	5 37	5 34	5 30	5 27
2	6 16	6 11	6 5	6 0	5 56	5 53	5 48	5 43	5 41	5 38	5 36	5 33	5 29
3	6 15	6 11	6 6	6 0	5 57	5 54	5 50	5 45	5 43	5 40	5 38	5 35	5 32
4	6 15	6 11	6 6	6 1	5 58	5 55	5 51	5 47	5 45	5 42	5 40	5 37	5 34
5	6 15	6 11	6 6	6 2	5 59	5 56	5 52	5 48	5 46	5 44	5 42	5 39	5 37
6	6 15	6 11	6 7	6 2	6 0	5 57	5 54	5 50	5 48	5 46	5 44	5 42	5 39
7	6 15	6 11	6 7	6 3	6 1	5 58	5 55	5 51	5 50	5 48	5 46	5 44	5 42
8	6 14	6 11	6 7	6 4	6 2	5 59	5 56	5 53	5 52	5 50	5 48	5 46	5 44
9	6 14	6 11	6 8	6 4	6 2	6 0	5 58	5 55	5 53	5 52	5 50	5 49	5 47
10	6 14	6 11	6 8	6 5	6 3	6 1	5 59	5 56	5 55	5 54	5 52	5 51	5 49
11	6 14	6 11	6 8	6 6	6 4	6 2	6 0	5 58	5 57	5 56	5 55	5 53	5 52
12	6 13	6 11	6 9	6 6	6 5	6 3	6 2	6 0	5 59	5 58	5 57	5 55	5 54
13	6 13	6 11	6 9	6 7	6 6	6 4	6 3	6 1	6 0	6 0	5 59	5 58	5 56
14	6 13	6 11	6 9	6 8	6 7	6 5	6 4	6 3	6 2	6 2	6 1	6 0	5 59
15	6 12	6 11	6 10	6 8	6 7	6 6	6 6	6 4	6 4	6 3	6 3	6 2	6 1
16	6 12	6 11	6 10	6 9	6 8	6 7	6 7	6 6	6 6	6 5	6 5	6 4	6 4
17	6 12	6 11	6 10	6 9	6 9	6 8	6 8	6 8	6 7	6 7	6 7	6 7	6 6
18	6 12	6 11	6 10	6 10	6 10	6 10	6 9	6 9	6 9	6 9	6 9	6 9	6 9
19	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11	6 11
20	6 11	6 11	6 11	6 11	6 12	6 12	6 12	6 12	6 13	6 13	6 13	6 13	6 14
21	6 11	6 11	6 11	6 12	6 12	6 13	6 13	6 14	6 14	6 15	6 15	6 16	6 16
22	6 10	6 11	6 12	6 13	6 13	6 14	6 15	6 16	6 16	6 17	6 17	6 18	6 19
23	6 10	6 11	6 12	6 13	6 14	6 15	6 16	6 17	6 18	6 18	6 19	6 20	6 21
24	6 10	6 11	6 12	6 14	6 15	6 16	6 17	6 19	6 20	6 20	6 21	6 22	6 23
25	6 9	6 11	6 12	6 14	6 15	6 17	6 18	6 20	6 21	6 22	6 23	6 25	6 26
26	6 9	6 11	6 13	6 15	6 16	6 18	6 20	6 22	6 23	6 24	6 25	6 27	6 28
27	6 9	6 11	6 13	6 16	6 17	6 19	6 21	6 23	6 25	6 26	6 27	6 29	6 31
28	6 8	6 11	6 13	6 16	6 18	6 20	6 22	6 25	6 26	6 28	6 29	6 31	6 33
29	6 8	6 11	6 13	6 17	6 19	6 21	6 23	6 27	6 28	6 30	6 31	6 33	6 36
30	6 8	6 11	6 14	6 17	6 20	6 22	6 25	6 28	6 30	6 32	6 34	6 36	6 38
31	6 8	6 11	6 14	6 18	6 20	6 23	6 26	6 30	6 31	6 33	6 36	6 38	6 40
Apr. 1	6 7	6 11	6 14	6 19	6 21	6 24	6 27	6 31	6 33	6 35	6 38	6 40	6 43
2	6 7	6 11	6 14	6 19	6 22	6 25	6 28	6 33	6 35	6 37	6 40	6 42	6 45

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	18 0	17 57	17 53	17 49	17 46	17 43	17 40	17 35	17 34	17 31	17 29	17 26	17 23
2	18 0	17 56	17 52	17 47	17 45	17 42	17 38	17 33	17 31	17 29	17 26	17 24	17 20
3	18 0	17 56	17 51	17 46	17 43	17 40	17 36	17 31	17 29	17 26	17 24	17 21	17 17
4	17 59	17 55	17 51	17 45	17 42	17 38	17 34	17 29	17 27	17 24	17 21	17 18	17 14
5	17 59	17 55	17 50	17 44	17 41	17 37	17 32	17 27	17 24	17 22	17 19	17 15	17 11
6	17 59	17 54	17 49	17 43	17 39	17 35	17 30	17 25	17 22	17 19	17 16	17 12	17 8
7	17 59	17 54	17 48	17 42	17 38	17 34	17 29	17 23	17 20	17 17	17 13	17 10	17 5
8	17 58	17 53	17 47	17 40	17 37	17 32	17 27	17 20	17 18	17 14	17 11	17 7	17 2
9	17 58	17 52	17 46	17 39	17 35	17 31	17 25	17 18	17 15	17 12	17 8	17 4	16 59
10	17 58	17 52	17 46	17 38	17 34	17 29	17 23	17 16	17 13	17 10	17 6	17 1	16 56
11	17 57	17 51	17 45	17 37	17 33	17 27	17 21	17 14	17 11	17 7	17 3	16 58	16 53
12	17 57	17 51	17 44	17 36	17 31	17 26	17 20	17 12	17 9	17 5	17 0	16 56	16 50
13	17 57	17 50	17 43	17 35	17 30	17 24	17 18	17 10	17 6	17 2	16 58	16 53	16 47
14	17 57	17 50	17 42	17 34	17 29	17 23	17 16	17 8	17 4	17 0	16 55	16 50	16 44
15	17 56	17 49	17 41	17 33	17 27	17 21	17 14	17 6	17 2	16 58	16 53	16 48	16 41
16	17 56	17 49	17 41	17 31	17 26	17 20	17 13	17 4	17 0	16 55	16 50	16 45	16 39
17	17 56	17 48	17 40	17 30	17 25	17 18	17 11	17 2	16 58	16 53	16 48	16 42	16 36
18	17 56	17 48	17 39	17 29	17 24	17 17	17 9	17 0	16 56	16 51	16 45	16 40	16 33
19	17 56	17 47	17 39	17 28	17 22	17 16	17 8	16 58	16 53	16 48	16 43	16 37	16 30
20	17 55	17 47	17 38	17 27	17 21	17 14	17 6	16 56	16 51	16 46	16 40	16 34	16 27
21	17 55	17 46	17 37	17 26	17 20	17 13	17 4	16 54	16 49	16 44	16 38	16 31	16 24
22	17 55	17 46	17 36	17 25	17 19	17 11	17 2	16 52	16 47	16 42	16 36	16 29	16 21
23	17 55	17 45	17 36	17 24	17 17	17 10	17 1	16 50	16 45	16 39	16 33	16 26	16 18
24	17 55	17 45	17 35	17 23	17 16	17 8	16 59	16 48	16 43	16 37	16 31	16 24	16 16
25	17 54	17 45	17 34	17 22	17 15	17 7	16 58	16 46	16 41	16 35	16 28	16 21	16 13
26	17 54	17 44	17 34	17 21	17 14	17 6	16 56	16 44	16 39	16 33	16 26	16 18	16 10
27	17 54	17 44	17 33	17 20	17 13	17 4	16 54	16 42	16 37	16 31	16 24	16 16	16 7
28	17 54	17 44	17 32	17 19	17 12	17 3	16 53	16 41	16 35	16 28	16 21	16 13	16 4
29	17 54	17 43	17 32	17 18	17 11	17 2	16 51	16 39	16 33	16 26	16 19	16 11	16 2
30	17 54	17 43	17 31	17 18	17 10	17 1	16 50	16 37	16 31	16 24	16 17	16 8	15 59
May 1	17 54	17 42	17 30	17 17	17 8	16 59	16 48	16 35	16 29	16 22	16 14	16 6	15 56
2	17 53	17 42	17 30	17 16	17 8	16 58	16 47	16 34	16 27	16 20	16 12	16 4	15 53
3	17 53	17 42	17 29	17 15	17 6	16 57	16 45	16 32	16 25	16 18	16 10	16 1	15 51
4	17 53	17 41	17 29	17 14	17 6	16 56	16 44	16 30	16 24	16 16	16 8	15 59	15 48
5	17 53	17 41	17 28	17 13	17 4	16 54	16 43	16 28	16 22	16 14	16 6	15 56	15 45
6	17 53	17 41	17 28	17 12	17 3	16 53	16 41	16 27	16 20	16 12	16 4	15 54	15 43
7	17 53	17 40	17 27	17 12	17 3	16 52	16 40	16 25	16 18	16 10	16 1	15 52	15 40
8	17 53	17 40	17 27	17 11	17 2	16 51	16 39	16 23	16 16	16 8	15 59	15 49	15 38
9	17 53	17 40	17 26	17 10	17 1	16 50	16 37	16 22	16 15	16 6	15 57	15 47	15 35
10	17 53	17 40	17 26	17 9	17 0	16 49	16 36	16 20	16 13	16 5	15 55	15 45	15 33
11	17 53	17 40	17 25	17 9	16 59	16 48	16 35	16 19	16 11	16 3	15 53	15 43	15 30
12	17 53	17 39	17 25	17 8	16 58	16 47	16 34	16 17	16 10	16 1	15 51	15 40	15 28
13	17 53	17 39	17 24	17 7	16 57	16 46	16 32	16 16	16 8	15 59	15 50	15 38	15 25
14	17 53	17 39	17 24	17 7	16 57	16 45	16 31	16 14	16 6	15 58	15 48	15 36	15 23
15	17 53	17 39	17 24	17 6	16 56	16 44	16 30	16 13	16 5	15 56	15 46	15 34	15 21
16	17 53	17 39	17 23	17 6	16 55	16 43	16 29	16 12	16 3	15 54	15 44	15 32	15 18
17	17 53	17 38	17 23	17 5	16 54	16 42	16 28	16 10	16 2	15 53	15 42	15 30	15 16

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 2	6 7	6 11	6 14	6 19	6 22	6 25	6 28	6 33	6 35	6 37	6 40	6 42	6 45
3	6 7	6 11	6 15	6 20	6 23	6 26	6 30	6 34	6 37	6 39	6 42	6 44	6 48
4	6 6	6 11	6 15	6 20	6 23	6 27	6 31	6 36	6 38	6 41	6 44	6 47	6 50
5	6 6	6 11	6 15	6 21	6 24	6 28	6 32	6 37	6 40	6 43	6 46	6 49	6 53
6	6 6	6 10	6 16	6 22	6 25	6 29	6 34	6 39	6 42	6 45	6 48	6 51	6 55
7	6 6	6 10	6 16	6 22	6 26	6 30	6 35	6 41	6 43	6 46	6 50	6 53	6 58
8	6 5	6 10	6 16	6 23	6 27	6 31	6 36	6 42	6 45	6 48	6 52	6 56	7 0
9	6 5	6 10	6 16	6 23	6 27	6 32	6 37	6 44	6 47	6 50	6 54	6 58	7 2
10	6 5	6 10	6 17	6 24	6 28	6 33	6 39	6 45	6 49	6 52	6 56	7 0	7 5
11	6 5	6 10	6 17	6 25	6 29	6 34	6 40	6 47	6 50	6 54	6 58	7 2	7 7
12	6 4	6 10	6 17	6 25	6 30	6 35	6 41	6 48	6 52	6 56	7 0	7 4	7 10
13	6 4	6 10	6 18	6 26	6 31	6 36	6 42	6 50	6 54	6 57	7 2	7 7	7 12
14	6 4	6 10	6 18	6 26	6 31	6 37	6 44	6 51	6 55	6 59	7 4	7 9	7 15
15	6 3	6 10	6 18	6 27	6 32	6 38	6 45	6 53	6 57	7 1	7 6	7 11	7 17
16	6 3	6 10	6 18	6 28	6 33	6 39	6 46	6 55	6 59	7 3	7 8	7 13	7 20
17	6 3	6 10	6 19	6 28	6 34	6 40	6 47	6 56	7 0	7 5	7 10	7 16	7 22
18	6 3	6 11	6 19	6 29	6 35	6 41	6 49	6 58	7 2	7 7	7 12	7 18	7 25
19	6 3	6 11	6 19	6 29	6 35	6 42	6 50	6 59	7 4	7 9	7 14	7 20	7 27
20	6 2	6 11	6 20	6 30	6 36	6 43	6 51	7 1	7 6	7 10	7 16	7 22	7 29
21	6 2	6 11	6 20	6 31	6 37	6 44	6 52	7 2	7 7	7 12	7 18	7 25	7 32
22	6 2	6 11	6 20	6 31	6 38	6 45	6 54	7 4	7 9	7 14	7 20	7 27	7 34
23	6 2	6 11	6 21	6 32	6 39	6 46	6 55	7 6	7 11	7 16	7 22	7 29	7 37
24	6 2	6 11	6 21	6 33	6 39	6 47	6 56	7 7	7 12	7 18	7 24	7 31	7 39
25	6 1	6 11	6 21	6 33	6 40	6 48	6 58	7 9	7 14	7 20	7 26	7 34	7 42
26	6 1	6 11	6 22	6 34	6 41	6 49	6 59	7 10	7 16	7 22	7 28	7 36	7 44
27	6 1	6 11	6 22	6 34	6 42	6 50	7 0	7 12	7 17	7 24	7 30	7 38	7 47
28	6 1	6 11	6 22	6 35	6 43	6 51	7 1	7 13	7 19	7 25	7 32	7 40	7 49
29	6 1	6 11	6 23	6 36	6 43	6 52	7 2	7 15	7 21	7 27	7 34	7 42	7 52
30	6 1	6 11	6 23	6 36	6 44	6 53	7 4	7 16	7 22	7 29	7 36	7 45	7 54
May 1	6 1	6 12	6 23	6 37	6 45	6 54	7 5	7 18	7 24	7 31	7 38	7 47	7 57
2	6 0	6 12	6 24	6 38	6 46	6 55	7 6	7 19	7 26	7 33	7 40	7 49	7 59
3	6 0	6 12	6 24	6 38	6 47	6 56	7 7	7 21	7 27	7 35	7 42	7 51	8 2
4	6 0	6 12	6 24	6 39	6 48	6 57	7 9	7 22	7 29	7 36	7 44	7 54	8 4
5	6 0	6 12	6 25	6 40	6 48	6 58	7 10	7 24	7 31	7 38	7 46	7 56	8 7
6	6 0	6 12	6 25	6 40	6 49	6 59	7 11	7 25	7 32	7 40	7 48	7 58	8 9
7	6 0	6 12	6 26	6 41	6 50	7 0	7 12	7 27	7 34	7 42	7 50	8 0	8 12
8	6 0	6 12	6 26	6 42	6 51	7 1	7 14	7 28	7 36	7 43	7 52	8 2	8 14
9	6 0	6 13	6 26	6 42	6 52	7 2	7 15	7 30	7 37	7 45	7 54	8 5	8 16
10	6 0	6 13	6 27	6 43	6 52	7 3	7 16	7 31	7 39	7 47	7 56	8 7	8 19
11	6 0	6 13	6 27	6 43	6 53	7 4	7 17	7 33	7 40	7 49	7 58	8 9	8 21
12	6 0	6 13	6 28	6 44	6 54	7 5	7 18	7 34	7 42	7 51	8 0	8 11	8 24
13	6 0	6 13	6 28	6 45	6 55	7 6	7 19	7 36	7 44	7 52	8 2	8 13	8 26
14	6 0	6 13	6 28	6 45	6 56	7 7	7 21	7 37	7 45	7 54	8 4	8 15	8 28
15	6 0	6 14	6 29	6 46	6 56	7 8	7 22	7 39	7 47	7 56	8 6	8 17	8 31
16	6 0	6 14	6 29	6 47	6 57	7 9	7 23	7 40	7 48	7 57	8 8	8 19	8 33
17	6 0	6 14	6 30	6 47	6 58	7 10	7 24	7 41	7 50	7 59	8 9	8 22	8 35
18	6 0	6 14	6 30	6 48	6 59	7 11	7 25	7 43	7 51	8 1	8 11	8 24	8 38

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 17	17 53	17 38	17 23	17 5	16 54	16 42	16 28	16 10	16 2	15 53	15 42	15 30	15 16
18	17 53	17 38	17 23	17 4	16 54	16 42	16 27	16 9	16 1	15 51	15 40	15 28	15 14
19	17 53	17 38	17 22	17 4	16 53	16 41	16 26	16 8	15 59	15 50	15 39	15 26	15 12
20	17 53	17 38	17 22	17 3	16 52	16 40	16 25	16 7	15 58	15 48	15 37	15 24	15 9
21	17 53	17 38	17 22	17 3	16 52	16 39	16 24	16 6	15 57	15 47	15 36	15 23	15 7
22	17 53	17 38	17 21	17 2	16 51	16 38	16 23	16 4	15 55	15 45	15 34	15 21	15 5
23	17 53	17 38	17 21	17 2	16 51	16 38	16 22	16 3	15 54	15 44	15 32	15 19	15 3
24	17 53	17 38	17 21	17 2	16 50	16 37	16 21	16 2	15 53	15 43	15 31	15 17	15 1
25	17 53	17 38	17 21	17 1	16 50	16 36	16 21	16 1	15 52	15 42	15 30	15 16	15 0
26	17 53	17 38	17 21	17 1	16 49	16 36	16 20	16 0	15 51	15 40	15 28	15 14	14 58
27	17 54	17 38	17 20	17 0	16 49	16 35	16 19	15 59	15 50	15 39	15 27	15 13	14 56
28	17 54	17 38	17 20	17 0	16 48	16 35	16 18	15 58	15 49	15 38	15 26	15 11	14 54
29	17 54	17 38	17 20	17 0	16 48	16 34	16 18	15 58	15 48	15 37	15 24	15 10	14 53
30	17 54	17 38	17 20	17 0	16 48	16 34	16 17	15 57	15 47	15 36	15 23	15 8	14 51
31	17 54	17 38	17 20	16 59	16 47	16 33	16 17	15 56	15 46	15 35	15 22	15 7	14 49
June 1	17 54	17 38	17 20	16 59	16 47	16 33	16 16	15 55	15 45	15 34	15 21	15 6	14 48
2	17 54	17 38	17 20	16 59	16 47	16 32	16 16	15 55	15 44	15 33	15 20	15 5	14 47
3	17 54	17 38	17 20	16 59	16 46	16 32	16 15	15 54	15 44	15 32	15 19	15 4	14 45
4	17 55	17 38	17 20	16 59	16 46	16 32	16 15	15 53	15 43	15 32	15 18	15 3	14 44
5	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 53	15 42	15 31	15 17	15 2	14 43
6	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 42	15 30	15 17	15 1	14 42
7	17 55	17 38	17 20	16 58	16 46	16 31	16 14	15 52	15 41	15 30	15 16	15 0	14 41
8	17 55	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 41	15 29	15 15	14 59	14 40
9	17 55	17 38	17 20	16 58	16 45	16 31	16 13	15 51	15 40	15 29	15 15	14 58	14 39
10	17 56	17 38	17 20	16 58	16 45	16 30	16 13	15 51	15 40	15 28	15 14	14 58	14 38
11	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 40	15 28	15 14	14 57	14 38
12	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 40	15 27	15 13	14 57	14 37
13	17 56	17 39	17 20	16 58	16 45	16 30	16 13	15 50	15 39	15 27	15 13	14 56	14 36
14	17 57	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
15	17 57	17 39	17 20	16 58	16 45	16 30	16 12	15 50	15 39	15 27	15 13	14 56	14 36
16	17 57	17 39	17 20	16 59	16 45	16 30	16 12	15 50	15 39	15 27	15 12	14 56	14 35
17	17 57	17 40	17 21	16 59	16 46	16 30	16 13	15 50	15 39	15 27	15 12	14 56	14 35
18	17 57	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 12	14 56	14 35
19	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
20	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 50	15 39	15 27	15 13	14 56	14 35
21	17 58	17 40	17 21	16 59	16 46	16 31	16 13	15 51	15 40	15 27	15 13	14 56	14 36
22	17 58	17 41	17 22	17 0	16 47	16 31	16 13	15 51	15 40	15 27	15 13	14 56	14 36
23	17 58	17 41	17 22	17 0	16 47	16 32	16 14	15 51	15 40	15 28	15 14	14 57	14 36
24	17 59	17 41	17 22	17 0	16 47	16 32	16 14	15 51	15 41	15 28	15 14	14 57	14 37
25	17 59	17 41	17 22	17 0	16 47	16 32	16 14	15 52	15 41	15 29	15 14	14 58	14 37
26	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 52	15 41	15 29	15 15	14 58	14 38
27	17 59	17 42	17 23	17 1	16 48	16 33	16 15	15 53	15 42	15 30	15 16	14 59	14 39
28	17 59	17 42	17 23	17 1	16 48	16 34	16 16	15 53	15 43	15 30	15 16	15 0	14 40
29	18 0	17 42	17 24	17 2	16 49	16 34	16 16	15 54	15 43	15 31	15 17	15 0	14 40
30	18 0	17 42	17 24	17 2	16 49	16 34	16 17	15 54	15 44	15 32	15 18	15 1	14 41
July 1	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 44	15 32	15 19	15 2	14 42
2	18 0	17 43	17 24	17 3	16 50	16 35	16 18	15 56	15 45	15 33	15 20	15 3	14 44

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May 18	6 0	6 14	6 30	6 48	6 59	7 11	7 25	7 43	7 51	8 1	8 11	8 24	8 38
19	6 0	6 15	6 30	6 49	6 59	7 12	7 26	7 44	7 53	8 2	8 13	8 26	8 40
20	6 0	6 15	6 31	6 49	7 0	7 13	7 27	7 45	7 54	8 4	8 15	8 27	8 42
21	6 0	6 15	6 31	6 50	7 1	7 13	7 28	7 47	7 56	8 5	8 17	8 29	8 44
22	6 0	6 15	6 32	6 51	7 2	7 14	7 29	7 48	7 57	8 7	8 18	8 31	8 47
23	6 0	6 16	6 32	6 51	7 2	7 15	7 30	7 49	7 58	8 8	8 20	8 33	8 49
24	6 0	6 16	6 32	6 52	7 3	7 16	7 31	7 51	8 0	8 10	8 22	8 35	8 51
25	6 0	6 16	6 33	6 52	7 4	7 17	7 32	7 52	8 1	8 11	8 23	8 37	8 53
26	6 0	6 16	6 33	6 53	7 4	7 18	7 33	7 53	8 2	8 13	8 25	8 39	8 55
27	6 1	6 17	6 34	6 54	7 5	7 19	7 34	7 54	8 4	8 14	8 27	8 41	8 57
28	6 1	6 17	6 34	6 54	7 6	7 19	7 35	7 55	8 5	8 16	8 28	8 42	8 59
29	6 1	6 17	6 34	6 55	7 6	7 20	7 36	7 57	8 6	8 17	8 30	8 44	9 1
30	6 1	6 17	6 35	6 55	7 7	7 21	7 37	7 58	8 7	8 18	8 31	8 46	9 3
31	6 1	6 17	6 35	6 56	7 8	7 22	7 38	7 59	8 9	8 20	8 32	8 47	9 5
June 1	6 1	6 18	6 35	6 56	7 8	7 22	7 39	8 0	8 10	8 21	8 34	8 49	9 7
2	6 1	6 18	6 36	6 57	7 9	7 23	7 40	8 1	8 11	8 22	8 35	8 50	9 8
3	6 2	6 18	6 36	6 57	7 10	7 24	7 41	8 2	8 12	8 23	8 36	8 52	9 10
4	6 2	6 19	6 37	6 58	7 10	7 24	7 41	8 3	8 13	8 24	8 38	8 53	9 12
5	6 2	6 19	6 37	6 58	7 11	7 25	7 42	8 4	8 14	8 25	8 39	8 54	9 13
6	6 2	6 19	6 37	6 59	7 11	7 26	7 43	8 4	8 15	8 26	8 40	8 56	9 15
7	6 2	6 19	6 38	6 59	7 12	7 26	7 44	8 5	8 16	8 27	8 41	8 57	9 16
8	6 2	6 20	6 38	7 0	7 12	7 27	7 44	8 6	8 17	8 28	8 42	8 58	9 17
9	6 3	6 20	6 39	7 0	7 13	7 27	7 45	8 7	8 17	8 29	8 43	8 59	9 19
10	6 3	6 20	6 39	7 0	7 13	7 28	7 46	8 8	8 18	8 30	8 44	9 0	9 20
11	6 3	6 20	6 39	7 1	7 14	7 28	7 46	8 8	8 19	8 31	8 45	9 1	9 21
12	6 3	6 21	6 39	7 1	7 14	7 29	7 47	8 9	8 20	8 32	8 46	9 2	9 22
13	6 4	6 21	6 40	7 2	7 14	7 29	7 47	8 9	8 20	8 32	8 46	9 3	9 23
14	6 4	6 21	6 40	7 2	7 15	7 30	7 48	8 10	8 21	8 33	8 47	9 4	9 24
15	6 4	6 21	6 40	7 2	7 15	7 30	7 48	8 11	8 21	8 34	8 48	9 5	9 25
16	6 4	6 22	6 41	7 2	7 16	7 31	7 48	8 11	8 22	8 34	8 48	9 5	9 26
17	6 4	6 22	6 41	7 3	7 16	7 31	7 49	8 11	8 22	8 35	8 49	9 6	9 26
18	6 5	6 22	6 41	7 3	7 16	7 31	7 49	8 12	8 23	8 35	8 49	9 6	9 27
19	6 5	6 22	6 41	7 3	7 17	7 32	7 50	8 12	8 23	8 35	8 50	9 7	9 27
20	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 12	8 23	8 36	8 50	9 7	9 27
21	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 50	9 7	9 28
22	6 5	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
23	6 6	6 23	6 42	7 4	7 17	7 32	7 50	8 13	8 24	8 36	8 51	9 7	9 28
24	6 6	6 23	6 42	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 8	9 28
25	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 8	9 28
26	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 51	9 7	9 28
27	6 6	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 27
28	6 7	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 7	9 27
29	6 7	6 24	6 43	7 5	7 18	7 33	7 51	8 13	8 24	8 36	8 50	9 6	9 27
30	6 7	6 24	6 43	7 5	7 18	7 33	7 50	8 13	8 23	8 35	8 49	9 6	9 26
July 1	6 7	6 25	6 43	7 5	7 18	7 33	7 50	8 13	8 23	8 35	8 49	9 6	9 25
2	6 8	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 22	8 34	8 48	9 4	9 24

TABLE VI.

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1929.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	18 0	17 43	17 24	17 2	16 50	16 35	16 17	15 55	15 44	15 32	15 19	15 2	14 42
2	18 0	17 43	17 24	17 3	16 50	16 35	16 18	15 56	15 45	15 33	15 20	15 3	14 44
3	18 0	17 43	17 25	17 3	16 51	16 36	16 18	15 57	15 46	15 34	15 20	15 4	14 45
4	18 1	17 44	17 25	17 4	16 51	16 37	16 19	15 57	15 47	15 35	15 21	15 6	14 46
5	18 1	17 44	17 25	17 4	16 51	16 37	16 20	15 58	15 48	15 36	15 22	15 7	14 47
6	18 1	17 44	17 26	17 5	16 52	16 38	16 20	15 59	15 49	15 37	15 24	15 8	14 49
7	18 1	17 44	17 26	17 5	16 53	16 38	16 21	16 0	15 50	15 38	15 25	15 9	14 50
8	18 1	17 45	17 27	17 5	16 53	16 39	16 22	16 1	15 51	15 39	15 26	15 10	14 52
9	18 1	17 45	17 27	17 6	16 54	16 40	16 23	16 2	15 52	15 40	15 27	15 12	14 54
10	18 2	17 45	17 27	17 7	16 54	16 40	16 24	16 3	15 53	15 41	15 28	15 13	14 55
11	18 2	17 45	17 28	17 7	16 55	16 41	16 24	16 4	15 54	15 43	15 30	15 15	14 57
12	18 2	17 46	17 28	17 8	16 56	16 42	16 25	16 5	15 55	15 44	15 31	15 16	14 59
13	18 2	17 46	17 28	17 8	16 56	16 42	16 26	16 6	15 56	15 45	15 33	15 18	15 1
14	18 2	17 46	17 29	17 9	16 57	16 43	16 27	16 7	15 57	15 46	15 34	15 20	15 2
15	18 2	17 46	17 29	17 9	16 57	16 44	16 28	16 8	15 58	15 48	15 36	15 21	15 4
16	18 2	17 47	17 29	17 10	16 58	16 45	16 29	16 9	16 0	15 49	15 37	15 23	15 6
17	18 2	17 47	17 30	17 10	16 59	16 46	16 30	16 10	16 1	15 50	15 39	15 25	15 8
18	18 2	17 47	17 30	17 11	16 59	16 46	16 31	16 11	16 2	15 52	15 40	15 27	15 10
19	18 3	17 47	17 31	17 11	17 0	16 47	16 32	16 13	16 3	15 53	15 42	15 28	15 13
20	18 3	17 47	17 31	17 12	17 1	16 48	16 33	16 14	16 5	15 55	15 43	15 30	15 15
21	18 3	17 48	17 31	17 13	17 2	16 49	16 34	16 15	16 6	15 56	15 45	15 32	15 17
22	18 3	17 48	17 32	17 13	17 2	16 50	16 35	16 16	16 8	15 58	15 47	15 34	15 19
23	18 3	17 48	17 32	17 14	17 3	16 51	16 36	16 18	16 9	15 59	15 48	15 36	15 21
24	18 3	17 48	17 32	17 14	17 4	16 51	16 37	16 19	16 10	16 1	15 50	15 38	15 23
25	18 3	17 48	17 33	17 15	17 4	16 52	16 38	16 20	16 12	16 3	15 52	15 40	15 26
26	18 3	17 49	17 33	17 15	17 5	16 53	16 39	16 22	16 13	16 4	15 54	15 42	15 28
27	18 3	17 49	17 34	17 16	17 6	16 54	16 40	16 23	16 15	16 6	15 55	15 44	15 30
28	18 3	17 49	17 34	17 17	17 7	16 55	16 41	16 25	16 17	16 8	15 57	15 46	15 33
29	18 3	17 49	17 34	17 17	17 7	16 56	16 42	16 26	16 18	16 9	15 59	15 48	15 35
30	18 3	17 49	17 35	17 18	17 8	16 57	16 43	16 27	16 19	16 11	16 1	15 50	15 37
31	18 3	17 49	17 35	17 18	17 9	16 58	16 45	16 28	16 21	16 12	16 3	15 52	15 39
Aug. 1	18 3	17 50	17 35	17 19	17 9	16 59	16 46	16 30	16 22	16 14	16 5	15 54	15 42
2	18 3	17 50	17 36	17 20	17 10	17 0	16 47	16 31	16 24	16 16	16 7	15 56	15 44
3	18 2	17 50	17 36	17 20	17 11	17 0	16 48	16 33	16 25	16 17	16 8	15 58	15 47
4	18 2	17 50	17 36	17 21	17 12	17 1	16 49	16 34	16 27	16 19	16 10	16 0	15 49
5	18 2	17 50	17 37	17 22	17 12	17 2	16 50	16 36	16 29	16 21	16 12	16 3	15 51
6	18 2	17 50	17 37	17 22	17 13	17 3	16 51	16 37	16 30	16 23	16 14	16 5	15 54
7	18 2	17 50	17 37	17 23	17 14	17 4	16 53	16 38	16 32	16 24	16 16	16 7	15 56
8	18 2	17 50	17 38	17 23	17 15	17 5	16 54	16 40	16 33	16 26	16 18	16 9	15 59
9	18 2	17 50	17 38	17 24	17 16	17 6	16 55	16 42	16 35	16 28	16 20	16 11	16 1
10	18 2	17 51	17 38	17 25	17 16	17 7	16 56	16 43	16 37	16 30	16 22	16 13	16 3
11	18 2	17 51	17 39	17 25	17 17	17 8	16 57	16 44	16 38	16 32	16 24	16 16	16 6
12	18 1	17 51	17 39	17 26	17 18	17 9	16 59	16 46	16 40	16 33	16 26	16 18	16 8
13	18 1	17 51	17 39	17 26	17 19	17 10	17 0	16 47	16 42	16 35	16 28	16 20	16 11
14	18 1	17 51	17 40	17 27	17 19	17 11	17 1	16 49	16 43	16 37	16 30	16 22	16 13
15	18 1	17 51	17 40	17 28	17 20	17 12	17 2	16 50	16 45	16 39	16 32	16 24	16 16
16	18 1	17 51	17 40	17 28	17 21	17 13	17 3	16 52	16 46	16 40	16 34	16 26	16 18

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 2	6 8	6 25	6 43	7 5	7 18	7 33	7 50	8 12	8 23	8 35	8 49	9 5	9 25
3	6 8	6 25	6 43	7 5	7 18	7 32	7 50	8 12	8 22	8 34	8 48	9 4	9 24
4	6 8	6 25	6 43	7 5	7 17	7 32	7 50	8 11	8 22	8 34	8 47	9 3	9 23
5	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 11	8 21	8 33	8 47	9 3	9 22
6	6 8	6 25	6 43	7 5	7 17	7 32	7 49	8 11	8 21	8 33	8 46	9 2	9 21
7	6 8	6 25	6 43	7 4	7 17	7 31	7 49	8 10	8 20	8 32	8 45	9 1	9 20
8	6 8	6 25	6 43	7 4	7 17	7 31	7 48	8 9	8 20	8 31	8 44	9 0	9 18
9	6 9	6 25	6 43	7 4	7 16	7 31	7 48	8 9	8 19	8 30	8 44	8 59	9 17
10	6 9	6 25	6 43	7 4	7 16	7 30	7 47	8 8	8 18	8 29	8 42	8 58	9 16
11	6 9	6 25	6 43	7 4	7 16	7 30	7 47	8 7	8 17	8 29	8 41	8 56	9 14
12	6 9	6 25	6 43	7 3	7 16	7 29	7 46	8 7	8 16	8 28	8 40	8 55	9 13
13	6 9	6 25	6 43	7 3	7 15	7 29	7 45	8 6	8 16	8 27	8 39	8 54	9 11
14	6 9	6 25	6 43	7 3	7 15	7 28	7 45	8 5	8 15	8 26	8 38	8 52	9 10
15	6 9	6 25	6 43	7 3	7 14	7 28	7 44	8 4	8 14	8 25	8 37	8 51	9 8
16	6 9	6 25	6 42	7 2	7 14	7 27	7 43	8 3	8 13	8 23	8 35	8 49	9 6
17	6 10	6 25	6 42	7 2	7 13	7 27	7 43	8 2	8 12	8 22	8 34	8 48	9 4
18	6 10	6 25	6 42	7 1	7 13	7 26	7 42	8 1	8 10	8 21	8 33	8 46	9 3
19	6 10	6 25	6 42	7 1	7 12	7 25	7 41	8 0	8 9	8 20	8 31	8 45	9 1
20	6 10	6 25	6 41	7 0	7 12	7 25	7 40	7 59	8 8	8 18	8 30	8 43	8 59
21	6 10	6 25	6 41	7 0	7 11	7 24	7 39	7 58	8 7	8 17	8 28	8 41	8 57
22	6 10	6 25	6 41	7 0	7 11	7 23	7 38	7 57	8 6	8 15	8 27	8 39	8 55
23	6 10	6 24	6 40	6 59	7 10	7 22	7 37	7 56	8 4	8 14	8 25	8 37	8 52
24	6 10	6 24	6 40	6 58	7 9	7 22	7 36	7 54	8 3	8 12	8 23	8 36	8 50
25	6 10	6 24	6 40	6 58	7 9	7 21	7 35	7 53	8 1	8 11	8 22	8 34	8 48
26	6 10	6 24	6 40	6 57	7 8	7 20	7 34	7 52	8 0	8 9	8 20	8 32	8 46
27	6 10	6 24	6 39	6 57	7 7	7 19	7 33	7 50	7 58	8 8	8 18	8 30	8 44
28	6 10	6 24	6 39	6 56	7 6	7 18	7 32	7 49	7 57	8 6	8 16	8 28	8 41
29	6 10	6 24	6 38	6 55	7 6	7 17	7 31	7 48	7 55	8 4	8 14	8 26	8 39
30	6 10	6 23	6 38	6 55	7 5	7 16	7 30	7 46	7 54	8 3	8 12	8 23	8 36
31	6 10	6 23	6 37	6 54	7 4	7 15	7 28	7 45	7 52	8 1	8 11	8 21	8 34
Aug. 1	6 9	6 23	6 37	6 53	7 3	7 14	7 27	7 43	7 51	7 59	8 9	8 19	8 31
2	6 9	6 22	6 36	6 53	7 2	7 13	7 26	7 42	7 49	7 57	8 7	8 17	8 29
3	6 9	6 22	6 36	6 52	7 1	7 12	7 24	7 40	7 47	7 55	8 4	8 15	8 26
4	6 9	6 22	6 35	6 51	7 0	7 11	7 23	7 38	7 45	7 53	8 2	8 12	8 24
5	6 9	6 22	6 35	6 50	6 59	7 10	7 22	7 37	7 44	7 52	8 0	8 10	8 21
6	6 9	6 21	6 34	6 49	6 58	7 8	7 20	7 35	7 42	7 50	7 58	8 8	8 19
7	6 9	6 21	6 34	6 49	6 57	7 7	7 19	7 33	7 40	7 48	7 56	8 5	8 16
8	6 9	6 21	6 33	6 48	6 56	7 6	7 18	7 32	7 38	7 45	7 54	8 3	8 13
9	6 9	6 20	6 33	6 47	6 55	7 5	7 16	7 30	7 36	7 44	7 52	8 0	8 11
10	6 8	6 20	6 32	6 46	6 54	7 4	7 15	7 28	7 34	7 41	7 49	7 58	8 8
11	6 8	6 19	6 31	6 45	6 53	7 2	7 13	7 26	7 32	7 39	7 47	7 56	8 5
12	6 8	6 19	6 31	6 44	6 52	7 1	7 12	7 25	7 30	7 37	7 45	7 53	8 3
13	6 8	6 19	6 30	6 43	6 51	7 0	7 10	7 23	7 29	7 35	7 42	7 51	8 0
14	6 8	6 18	6 29	6 42	6 50	6 59	7 9	7 21	7 27	7 33	7 40	7 48	7 57
15	6 8	6 18	6 29	6 41	6 49	6 57	7 7	7 19	7 25	7 31	7 38	7 46	7 54
16	6 7	6 17	6 28	6 40	6 48	6 56	7 5	7 17	7 23	7 29	7 35	7 43	7 51
17	6 7	6 17	6 27	6 39	6 46	6 54	7 4	7 15	7 21	7 27	7 33	7 40	7 49

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	18 1	17 51	17 40	17 28	17 21	17 13	17 3	16 52	16 46	16 40	16 34	16 26	16 18
17	18 0	17 51	17 41	17 28	17 22	17 14	17 5	16 53	16 48	16 42	16 36	16 29	16 20
18	18 0	17 51	17 41	17 29	17 22	17 15	17 6	16 55	16 50	16 44	16 38	16 31	16 23
19	18 0	17 51	17 41	17 30	17 23	17 16	17 7	16 56	16 51	16 46	16 40	16 33	16 25
20	18 0	17 51	17 41	17 30	17 24	17 17	17 8	16 58	16 53	16 48	16 42	16 35	16 28
21	17 59	17 51	17 42	17 31	17 25	17 18	17 9	16 59	16 55	16 49	16 44	16 37	16 30
22	17 59	17 51	17 42	17 32	17 25	17 19	17 10	17 1	16 56	16 51	16 46	16 39	16 32
23	17 59	17 51	17 42	17 32	17 26	17 19	17 12	17 2	16 58	16 53	16 47	16 41	16 35
24	17 58	17 51	17 42	17 33	17 27	17 20	17 13	17 4	16 59	16 55	16 49	16 44	16 37
25	17 58	17 51	17 43	17 33	17 28	17 21	17 14	17 5	17 1	16 57	16 51	16 46	16 39
26	17 58	17 51	17 43	17 34	17 28	17 22	17 15	17 7	17 3	16 58	16 53	16 48	16 42
27	17 58	17 51	17 43	17 34	17 29	17 23	17 16	17 8	17 4	17 0	16 55	16 50	16 44
28	17 58	17 51	17 43	17 35	17 30	17 24	17 18	17 10	17 6	17 2	16 57	16 52	16 47
29	17 57	17 51	17 44	17 36	17 31	17 25	17 19	17 11	17 8	17 4	16 59	16 54	16 49
30	17 57	17 51	17 44	17 36	17 31	17 26	17 20	17 13	17 9	17 5	17 1	16 57	16 51
31	17 57	17 51	17 44	17 37	17 32	17 27	17 21	17 14	17 11	17 7	17 3	16 59	16 54
Sept. 1	17 56	17 51	17 44	17 37	17 33	17 28	17 22	17 16	17 12	17 9	17 5	17 1	16 56
2	17 56	17 51	17 45	17 38	17 34	17 29	17 24	17 17	17 14	17 11	17 7	17 3	16 58
3	17 56	17 50	17 45	17 38	17 34	17 30	17 25	17 19	17 16	17 13	17 9	17 5	17 1
4	17 55	17 50	17 45	17 39	17 35	17 31	17 26	17 20	17 17	17 14	17 11	17 7	17 3
5	17 55	17 50	17 45	17 39	17 36	17 32	17 27	17 22	17 19	17 16	17 13	17 9	17 5
6	17 55	17 50	17 46	17 40	17 37	17 33	17 28	17 23	17 21	17 18	17 15	17 12	17 8
7	17 54	17 50	17 46	17 40	17 37	17 34	17 30	17 25	17 22	17 20	17 17	17 14	17 10
8	17 54	17 50	17 46	17 41	17 38	17 35	17 31	17 26	17 24	17 22	17 19	17 16	17 13
9	17 54	17 50	17 46	17 42	17 39	17 36	17 32	17 28	17 26	17 23	17 21	17 18	17 15
10	17 53	17 50	17 46	17 42	17 39	17 37	17 33	17 29	17 27	17 25	17 23	17 20	17 17
11	17 53	17 50	17 47	17 43	17 40	17 38	17 34	17 31	17 29	17 27	17 25	17 22	17 20
12	17 53	17 50	17 47	17 43	17 41	17 38	17 36	17 32	17 30	17 29	17 27	17 24	17 22
13	17 52	17 50	17 47	17 44	17 42	17 39	17 37	17 33	17 32	17 30	17 29	17 27	17 24
14	17 52	17 50	17 47	17 44	17 42	17 40	17 38	17 35	17 34	17 32	17 31	17 29	17 27
15	17 52	17 50	17 47	17 45	17 43	17 41	17 39	17 37	17 35	17 34	17 33	17 31	17 29
16	17 51	17 50	17 48	17 45	17 44	17 42	17 40	17 38	17 37	17 36	17 35	17 33	17 31
17	17 51	17 49	17 48	17 46	17 45	17 43	17 42	17 40	17 39	17 38	17 36	17 35	17 34
18	17 51	17 49	17 48	17 46	17 45	17 44	17 43	17 41	17 40	17 39	17 38	17 37	17 36
19	17 50	17 49	17 48	17 47	17 46	17 45	17 44	17 43	17 42	17 41	17 40	17 39	17 38
20	17 50	17 49	17 48	17 47	17 47	17 46	17 45	17 44	17 44	17 43	17 42	17 42	17 41
21	17 50	17 49	17 49	17 48	17 48	17 47	17 46	17 46	17 45	17 45	17 44	17 44	17 43
22	17 49	17 49	17 49	17 49	17 48	17 48	17 48	17 47	17 47	17 47	17 46	17 46	17 46
23	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 49	17 48	17 48	17 48	17 48	17 48
24	17 48	17 49	17 49	17 50	17 50	17 50	17 50	17 50	17 50	17 50	17 50	17 50	17 50
25	17 48	17 49	17 50	17 50	17 50	17 51	17 51	17 52	17 52	17 52	17 52	17 52	17 53
26	17 48	17 49	17 50	17 51	17 51	17 52	17 52	17 53	17 54	17 54	17 54	17 55	17 55
27	17 47	17 49	17 50	17 51	17 52	17 53	17 54	17 55	17 55	17 56	17 56	17 57	17 57
28	17 47	17 49	17 50	17 52	17 53	17 54	17 55	17 56	17 57	17 57	17 58	17 59	18 0
29	17 47	17 49	17 51	17 53	17 54	17 55	17 56	17 58	17 58	17 59	18 0	18 1	18 2
30	17 46	17 49	17 51	17 53	17 54	17 56	17 57	17 59	18 0	18 1	18 2	18 3	18 4
Oct. 1	17 46	17 49	17 51	17 54	17 55	17 57	17 59	18 1	18 2	18 3	18 4	18 5	18 7

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 17	6 7	6 17	6 27	6 39	6 46	6 54	7 4	7 15	7 21	7 27	7 33	7 40	7 49
18	6 7	6 16	6 27	6 38	6 45	6 53	7 2	7 13	7 18	7 24	7 31	7 38	7 46
19	6 7	6 16	6 26	6 37	6 44	6 52	7 0	7 11	7 16	7 22	7 28	7 35	7 43
20	6 7	6 15	6 25	6 36	6 43	6 50	6 59	7 9	7 14	7 20	7 26	7 33	7 40
21	6 6	6 15	6 24	6 35	6 42	6 49	6 57	7 7	7 12	7 17	7 23	7 30	7 37
22	6 6	6 14	6 24	6 34	6 40	6 47	6 56	7 6	7 10	7 15	7 21	7 27	7 34
23	6 6	6 14	6 23	6 33	6 39	6 46	6 54	7 4	7 8	7 13	7 18	7 25	7 31
24	6 6	6 13	6 22	6 32	6 38	6 44	6 52	7 1	7 6	7 11	7 16	7 22	7 28
25	6 5	6 13	6 21	6 31	6 37	6 43	6 50	6 59	7 4	7 8	7 13	7 19	7 26
26	6 5	6 12	6 20	6 30	6 35	6 41	6 49	6 57	7 1	7 6	7 11	7 16	7 23
27	6 5	6 12	6 20	6 29	6 34	6 40	6 47	6 55	6 59	7 4	7 8	7 14	7 20
28	6 4	6 11	6 19	6 28	6 33	6 38	6 45	6 53	6 57	7 1	7 6	7 11	7 17
29	6 4	6 11	6 18	6 26	6 31	6 37	6 43	6 51	6 55	6 59	7 3	7 8	7 14
30	6 4	6 10	6 17	6 25	6 30	6 35	6 42	6 49	6 53	6 56	7 1	7 6	7 11
31	6 4	6 10	6 16	6 24	6 29	6 34	6 40	6 47	6 50	6 54	6 58	7 3	7 8
Sept. 1	6 3	6 9	6 15	6 23	6 27	6 32	6 38	6 45	6 48	6 52	6 56	7 0	7 5
2	6 3	6 8	6 15	6 22	6 26	6 31	6 36	6 43	6 46	6 49	6 53	6 57	7 2
3	6 2	6 8	6 14	6 20	6 24	6 29	6 34	6 41	6 44	6 47	6 50	6 54	6 59
4	6 2	6 7	6 13	6 19	6 23	6 27	6 32	6 38	6 41	6 44	6 48	6 52	6 56
5	6 2	6 7	6 12	6 18	6 22	6 26	6 30	6 36	6 39	6 42	6 45	6 49	6 53
6	6 2	6 6	6 11	6 17	6 20	6 24	6 29	6 34	6 37	6 39	6 43	6 46	6 50
7	6 1	6 5	6 10	6 16	6 19	6 23	6 27	6 32	6 34	6 37	6 40	6 43	6 47
8	6 1	6 5	6 9	6 14	6 17	6 21	6 25	6 30	6 32	6 35	6 37	6 40	6 44
9	6 0	6 4	6 8	6 13	6 16	6 19	6 23	6 28	6 30	6 32	6 35	6 38	6 41
10	6 0	6 4	6 7	6 12	6 15	6 18	6 21	6 25	6 27	6 30	6 32	6 35	6 38
11	6 0	6 3	6 7	6 11	6 13	6 16	6 19	6 23	6 25	6 27	6 29	6 32	6 35
12	5 59	6 2	6 6	6 9	6 12	6 14	6 17	6 21	6 23	6 25	6 27	6 29	6 31
13	5 59	6 2	6 5	6 8	6 10	6 13	6 15	6 19	6 20	6 22	6 24	6 26	6 28
14	5 59	6 1	6 4	6 7	6 9	6 11	6 14	6 17	6 18	6 20	6 21	6 23	6 25
15	5 58	6 1	6 3	6 6	6 7	6 9	6 12	6 15	6 16	6 17	6 19	6 20	6 22
16	5 58	6 0	6 2	6 5	6 6	6 8	6 10	6 12	6 13	6 15	6 16	6 18	6 19
17	5 58	5 59	6 1	6 3	6 5	6 6	6 8	6 10	6 11	6 12	6 13	6 15	6 16
18	5 57	5 59	6 0	6 2	6 3	6 4	6 6	6 8	6 9	6 10	6 11	6 12	6 13
19	5 57	5 58	5 59	6 1	6 2	6 3	6 4	6 6	6 6	6 7	6 8	6 9	6 10
20	5 57	5 57	5 58	6 0	6 0	6 1	6 2	6 4	6 4	6 5	6 5	6 6	6 7
21	5 56	5 57	5 57	5 58	5 59	6 0	6 0	6 1	6 2	6 2	6 3	6 3	6 4
22	5 56	5 56	5 57	5 57	5 57	5 58	5 58	5 59	5 59	6 0	6 0	6 1	6 1
23	5 56	5 56	5 56	5 56	5 56	5 56	5 56	5 57	5 57	5 57	5 57	5 58	5 58
24	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55	5 55
25	5 55	5 54	5 54	5 53	5 53	5 53	5 53	5 52	5 52	5 52	5 52	5 52	5 52
26	5 55	5 54	5 53	5 52	5 52	5 51	5 51	5 50	5 50	5 50	5 49	5 49	5 49
27	5 54	5 53	5 52	5 51	5 50	5 50	5 49	5 48	5 48	5 47	5 47	5 46	5 46
28	5 54	5 52	5 51	5 50	5 49	5 48	5 47	5 46	5 45	5 45	5 44	5 44	5 43
29	5 54	5 52	5 50	5 48	5 47	5 46	5 45	5 44	5 43	5 42	5 42	5 41	5 40
30	5 53	5 51	5 49	5 47	5 46	5 45	5 43	5 41	5 41	5 40	5 39	5 38	5 37
Oct. 1	5 53	5 51	5 48	5 46	5 44	5 43	5 41	5 39	5 38	5 37	5 36	5 35	5 34
2	5 53	5 50	5 47	5 45	5 43	5 41	5 39	5 37	5 36	5 35	5 34	5 32	5 31

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	17 46	17 49	17 51	17 54	17 55	17 57	17 59	18 1	18 2	18 3	18 4	18 5	18 7
2	17 46	17 49	17 51	17 54	17 56	17 58	18 0	18 2	18 3	18 5	18 6	18 8	18 9
3	17 46	17 48	17 52	17 55	17 57	17 59	18 1	18 4	18 5	18 7	18 8	18 10	18 12
4	17 45	17 48	17 52	17 55	17 57	18 0	18 2	18 6	18 7	18 8	18 10	18 12	18 14
5	17 45	17 48	17 52	17 56	17 58	18 1	18 4	18 7	18 8	18 10	18 12	18 14	18 16
6	17 45	17 48	17 52	17 57	17 59	18 2	18 5	18 9	18 10	18 12	18 14	18 16	18 19
7	17 44	17 48	17 53	17 57	18 0	18 3	18 6	18 10	18 12	18 14	18 16	18 18	18 21
8	17 44	17 48	17 53	17 58	18 1	18 4	18 7	18 12	18 14	18 16	18 18	18 21	18 24
9	17 44	17 48	17 53	17 58	18 1	18 5	18 9	18 13	18 15	18 18	18 20	18 23	18 26
10	17 44	17 48	17 53	17 59	18 2	18 6	18 10	18 15	18 17	18 20	18 22	18 25	18 28
11	17 44	17 48	17 54	18 0	18 3	18 7	18 11	18 17	18 19	18 21	18 24	18 27	18 31
12	17 43	17 48	17 54	18 0	18 4	18 8	18 13	18 18	18 21	18 23	18 26	18 30	18 33
13	17 43	17 48	17 54	18 1	18 5	18 9	18 14	18 20	18 22	18 25	18 28	18 32	18 36
14	17 43	17 49	17 55	18 2	18 6	18 10	18 15	18 21	18 24	18 27	18 30	18 34	18 38
15	17 42	17 49	17 55	18 2	18 6	18 11	18 16	18 23	18 26	18 29	18 32	18 36	18 41
16	17 42	17 49	17 55	18 3	18 7	18 12	18 18	18 24	18 28	18 31	18 35	18 39	18 43
17	17 42	17 49	17 56	18 4	18 8	18 13	18 19	18 26	18 29	18 33	18 37	18 41	18 46
18	17 42	17 49	17 56	18 4	18 9	18 14	18 20	18 28	18 31	18 35	18 39	18 43	18 48
19	17 42	17 49	17 56	18 5	18 10	18 15	18 22	18 29	18 33	18 37	18 41	18 46	18 51
20	17 41	17 49	17 57	18 6	18 11	18 16	18 23	18 31	18 35	18 39	18 43	18 48	18 53
21	17 41	17 49	17 57	18 6	18 12	18 18	18 24	18 33	18 36	18 40	18 45	18 50	18 56
22	17 41	17 49	17 58	18 7	18 12	18 19	18 26	18 34	18 38	18 42	18 47	18 52	18 58
23	17 41	17 49	17 58	18 8	18 13	18 20	18 27	18 36	18 40	18 44	18 49	18 55	19 1
24	17 41	17 49	17 58	18 8	18 14	18 21	18 28	18 38	18 42	18 46	18 51	18 57	19 3
25	17 41	17 49	17 59	18 9	18 15	18 22	18 30	18 39	18 43	18 48	18 53	18 59	19 6
26	17 41	17 50	17 59	18 10	18 16	18 23	18 31	18 41	18 45	18 50	18 56	19 2	19 8
27	17 41	17 50	18 0	18 11	18 17	18 24	18 32	18 42	18 47	18 52	18 58	19 4	19 11
28	17 40	17 50	18 0	18 11	18 18	18 25	18 34	18 44	18 49	18 54	19 0	19 6	19 13
29	17 40	17 50	18 0	18 12	18 19	18 26	18 35	18 46	18 50	18 56	19 2	19 9	19 16
30	17 40	17 50	18 1	18 13	18 20	18 27	18 37	18 47	18 52	18 58	19 4	19 11	19 19
31	17 40	17 51	18 1	18 14	18 21	18 29	18 38	18 49	18 54	19 0	19 6	19 13	19 21
Nov. 1	17 40	17 51	18 2	18 14	18 22	18 30	18 39	18 51	18 56	19 2	19 8	19 16	19 24
2	17 40	17 51	18 2	18 15	18 23	18 31	18 41	18 52	18 58	19 4	19 10	19 18	19 26
3	17 40	17 51	18 3	18 16	18 23	18 32	18 42	18 54	19 0	19 6	19 13	19 20	19 29
4	17 40	17 51	18 3	18 17	18 24	18 33	18 43	18 56	19 1	19 8	19 15	19 23	19 31
5	17 40	17 52	18 4	18 18	18 25	18 34	18 45	18 57	19 3	19 10	19 17	19 25	19 34
6	17 40	17 52	18 4	18 18	18 26	18 36	18 46	18 59	19 5	19 12	19 19	19 27	19 37
7	17 40	17 52	18 5	18 19	18 27	18 37	18 48	19 1	19 7	19 14	19 21	19 30	19 39
8	17 41	17 53	18 5	18 20	18 28	18 38	18 49	19 2	19 9	19 15	19 23	19 32	19 42
9	17 41	17 53	18 6	18 21	18 29	18 39	18 50	19 4	19 10	19 17	19 25	19 34	19 44
10	17 41	17 53	18 7	18 22	18 30	18 40	18 52	19 6	19 12	19 19	19 27	19 37	19 47
11	17 41	17 54	18 7	18 22	18 31	18 41	18 53	19 7	19 14	19 21	19 30	19 39	19 49
12	17 41	17 54	18 8	18 23	18 32	18 42	18 54	19 9	19 16	19 23	19 32	19 41	19 52
13	17 41	17 54	18 8	18 24	18 33	18 44	18 56	19 11	19 18	19 25	19 34	19 43	19 55
14	17 41	17 55	18 9	18 25	18 34	18 45	18 57	19 12	19 19	19 27	19 36	19 46	19 57
15	17 41	17 55	18 9	18 26	18 35	18 46	18 59	19 14	19 21	19 29	19 38	19 48	20 0
16	17 42	17 55	18 10	18 27	18 36	18 47	19 0	19 16	19 23	19 31	19 40	19 50	20 2

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 2	5 53	5 50	5 47	5 45	5 43	5 41	5 39	5 37	5 36	5 35	5 34	5 32	5 31
3	5 52	5 49	5 47	5 44	5 42	5 40	5 38	5 35	5 34	5 32	5 31	5 29	5 28
4	5 52	5 49	5 46	5 42	5 40	5 38	5 36	5 33	5 31	5 30	5 28	5 27	5 25
5	5 52	5 48	5 45	5 41	5 39	5 37	5 34	5 31	5 29	5 28	5 26	5 24	5 22
6	5 51	5 48	5 44	5 40	5 38	5 35	5 32	5 28	5 27	5 25	5 23	5 21	5 19
7	5 51	5 47	5 43	5 39	5 36	5 33	5 30	5 26	5 25	5 23	5 21	5 18	5 16
8	5 51	5 47	5 42	5 38	5 35	5 32	5 28	5 24	5 22	5 20	5 18	5 16	5 13
9	5 51	5 46	5 42	5 37	5 34	5 30	5 27	5 22	5 20	5 18	5 16	5 13	5 10
10	5 50	5 46	5 41	5 35	5 32	5 29	5 25	5 20	5 18	5 15	5 13	5 10	5 7
11	5 50	5 45	5 40	5 34	5 31	5 27	5 23	5 18	5 16	5 13	5 10	5 7	5 4
12	5 50	5 45	5 39	5 33	5 30	5 26	5 21	5 16	5 13	5 11	5 8	5 5	5 1
13	5 50	5 44	5 38	5 32	5 28	5 24	5 19	5 14	5 11	5 8	5 5	5 2	4 58
14	5 49	5 44	5 38	5 31	5 27	5 23	5 18	5 12	5 9	5 6	5 3	4 59	4 55
15	5 49	5 43	5 37	5 30	5 26	5 21	5 16	5 10	5 7	5 4	5 0	4 56	4 52
16	5 49	5 43	5 36	5 29	5 24	5 20	5 14	5 8	5 5	5 1	4 58	4 54	4 49
17	5 49	5 42	5 35	5 27	5 23	5 18	5 12	5 6	5 2	4 59	4 55	4 51	4 46
18	5 49	5 42	5 35	5 26	5 22	5 17	5 11	5 4	5 0	4 57	4 53	4 48	4 43
19	5 48	5 41	5 34	5 25	5 21	5 15	5 9	5 2	4 58	4 54	4 50	4 46	4 40
20	5 48	5 41	5 33	5 24	5 19	5 14	5 7	5 0	4 56	4 52	4 48	4 43	4 38
21	5 48	5 40	5 32	5 23	5 18	5 12	5 6	4 58	4 54	4 50	4 46	4 40	4 35
22	5 48	5 40	5 32	5 22	5 17	5 11	5 4	4 56	4 52	4 48	4 43	4 38	4 32
23	5 48	5 40	5 31	5 21	5 16	5 10	5 2	4 54	4 50	4 45	4 41	4 35	4 29
24	5 48	5 39	5 30	5 20	5 15	5 8	5 1	4 52	4 48	4 43	4 38	4 33	4 26
25	5 48	5 39	5 30	5 19	5 14	5 7	4 59	4 50	4 46	4 41	4 36	4 30	4 24
26	5 47	5 38	5 29	5 18	5 12	5 6	4 58	4 48	4 44	4 39	4 34	4 28	4 21
27	5 47	5 38	5 29	5 18	5 11	5 4	4 56	4 46	4 42	4 37	4 31	4 25	4 18
28	5 47	5 38	5 28	5 17	5 10	5 3	4 55	4 45	4 40	4 35	4 29	4 23	4 16
29	5 47	5 37	5 27	5 16	5 9	5 2	4 53	4 43	4 38	4 33	4 27	4 20	4 13
30	5 47	5 37	5 27	5 15	5 8	5 1	4 52	4 41	4 36	4 31	4 25	4 18	4 10
31	5 47	5 37	5 26	5 14	5 7	4 59	4 50	4 39	4 34	4 29	4 22	4 15	4 8
Nov. 1	5 47	5 37	5 26	5 13	5 6	4 58	4 49	4 38	4 32	4 27	4 20	4 13	4 5
2	5 47	5 36	5 25	5 13	5 5	4 57	4 47	4 36	4 30	4 25	4 18	4 11	4 2
3	5 47	5 36	5 25	5 12	5 4	4 56	4 46	4 34	4 29	4 23	4 16	4 8	4 0
4	5 47	5 36	5 24	5 11	5 3	4 55	4 45	4 33	4 27	4 21	4 14	4 6	3 57
5	5 47	5 36	5 24	5 10	5 2	4 54	4 43	4 31	4 25	4 19	4 12	4 4	3 55
6	5 47	5 36	5 23	5 10	5 2	4 53	4 42	4 29	4 23	4 17	4 10	4 1	3 52
7	5 47	5 35	5 23	5 9	5 1	4 51	4 41	4 28	4 22	4 15	4 8	3 59	3 50
8	5 47	5 35	5 23	5 8	5 0	4 50	4 39	4 26	4 20	4 13	4 6	3 57	3 47
9	5 47	5 35	5 22	5 8	4 59	4 49	4 38	4 25	4 18	4 12	4 4	3 55	3 45
10	5 47	5 35	5 22	5 7	4 58	4 49	4 37	4 23	4 17	4 10	4 2	3 53	3 42
11	5 48	5 35	5 21	5 6	4 58	4 48	4 36	4 22	4 15	4 8	4 0	3 51	3 40
12	5 48	5 35	5 21	5 6	4 57	4 47	4 35	4 20	4 14	4 6	3 58	3 49	3 38
13	5 48	5 35	5 21	5 5	4 56	4 46	4 34	4 19	4 12	4 5	3 56	3 47	3 36
14	5 48	5 35	5 21	5 5	4 55	4 45	4 33	4 18	4 11	4 3	3 55	3 45	3 33
15	5 48	5 35	5 20	5 4	4 55	4 44	4 32	4 16	4 9	4 2	3 53	3 43	3 31
16	5 48	5 35	5 20	5 4	4 54	4 43	4 31	4 15	4 8	4 0	3 51	3 41	3 29
17	5 49	5 35	5 20	5 3	4 54	4 43	4 30	4 14	4 7	3 58	3 49	3 39	3 27

LOCAL ASTRONOMICAL MEAN TIME OF SUNRISE (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, subtract 12 hours, mark the result A. M., and add one to the day.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunrise in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	17 42	17 55	18 10	18 27	18 36	18 47	19 0	19 16	19 23	19 31	19 40	19 50	20 2
17	17 42	17 56	18 11	18 27	18 37	18 48	19 1	19 17	19 25	19 33	19 42	19 52	20 5
18	17 42	17 56	18 11	18 28	18 38	18 49	19 3	19 19	19 26	19 35	19 44	19 55	20 7
19	17 42	17 57	18 12	18 29	18 39	18 51	19 4	19 20	19 28	19 36	19 46	19 57	20 10
20	17 42	17 57	18 12	18 30	18 40	18 52	19 5	19 22	19 30	19 38	19 48	19 59	20 12
21	17 43	17 58	18 13	18 31	18 41	18 53	19 7	19 23	19 31	19 40	19 50	20 1	20 14
22	17 43	17 58	18 14	18 32	18 42	18 54	19 8	19 25	19 33	19 42	19 52	20 3	20 17
23	17 43	17 58	18 14	18 32	18 43	18 55	19 9	19 26	19 35	19 44	19 54	20 5	20 19
24	17 43	17 59	18 15	18 33	18 44	18 56	19 10	19 28	19 36	19 45	19 56	20 8	20 22
25	17 44	17 59	18 15	18 34	18 45	18 57	19 12	19 29	19 38	19 47	19 57	20 10	20 24
26	17 44	18 0	18 16	18 35	18 46	18 58	19 13	19 31	19 39	19 49	19 59	20 12	20 26
27	17 44	18 0	18 17	18 36	18 47	18 59	19 14	19 32	19 41	19 50	20 1	20 14	20 28
28	17 45	18 1	18 17	18 36	18 48	19 0	19 15	19 34	19 42	19 52	20 3	20 15	20 30
29	17 45	18 1	18 18	18 37	18 48	19 1	19 17	19 35	19 44	19 54	20 5	20 17	20 32
30	17 45	18 2	18 19	18 38	18 49	19 2	19 18	19 36	19 45	19 55	20 6	20 19	20 34
Dec. 1	17 46	18 2	18 19	18 39	18 50	19 3	19 19	19 38	19 47	19 57	20 8	20 21	20 36
2	17 46	18 3	18 20	18 40	18 51	19 4	19 20	19 39	19 48	19 58	20 10	20 23	20 38
3	17 47	18 3	18 21	18 41	18 52	19 5	19 21	19 40	19 49	20 0	20 11	20 25	20 40
4	17 47	18 4	18 21	18 41	18 53	19 6	19 22	19 41	19 51	20 1	20 13	20 26	20 42
5	17 47	18 4	18 22	18 42	18 54	19 7	19 23	19 43	19 52	20 2	20 14	20 28	20 44
6	17 48	18 5	18 22	18 43	18 55	19 8	19 24	19 44	19 53	20 4	20 16	20 29	20 46
7	17 48	18 5	18 23	18 44	18 55	19 9	19 25	19 45	19 54	20 5	20 17	20 31	20 47
8	17 49	18 6	18 24	18 44	18 56	19 10	19 26	19 46	19 56	20 6	20 18	20 32	20 49
9	17 49	18 6	18 24	18 45	18 57	19 11	19 27	19 47	19 57	20 7	20 20	20 34	20 50
10	17 50	18 7	18 25	18 46	18 58	19 12	19 28	19 48	19 58	20 9	20 21	20 35	20 52
11	17 50	18 7	18 25	18 46	18 58	19 12	19 29	19 49	19 59	20 10	20 22	20 36	20 53
12	17 51	18 8	18 26	18 47	18 59	19 13	19 30	19 50	20 0	20 11	20 23	20 38	20 55
13	17 51	18 8	18 27	18 48	19 0	19 14	19 31	19 51	20 1	20 12	20 24	20 39	20 56
14	17 52	18 9	18 27	18 48	19 1	19 15	19 31	19 52	20 2	20 13	20 25	20 40	20 57
15	17 52	18 9	18 28	18 49	19 1	19 15	19 32	19 53	20 3	20 13	20 26	20 41	20 58
16	17 52	18 10	18 28	18 50	19 2	19 16	19 33	19 53	20 3	20 14	20 27	20 42	20 59
17	17 53	18 10	18 29	18 50	19 2	19 17	19 33	19 54	20 4	20 15	20 28	20 43	21 0
18	17 53	18 11	18 29	18 51	19 3	19 17	19 34	19 55	20 5	20 16	20 29	20 43	21 1
19	17 54	18 11	18 30	18 51	19 4	19 18	19 35	19 55	20 5	20 16	20 29	20 44	21 2
20	17 54	18 12	18 30	18 52	19 4	19 18	19 35	19 56	20 6	20 17	20 30	20 45	21 2
21	17 55	18 12	18 31	18 52	19 5	19 19	19 36	19 56	20 6	20 18	20 30	20 45	21 3
22	17 55	18 13	18 31	18 53	19 5	19 19	19 36	19 57	20 7	20 18	20 31	20 46	21 3
23	17 56	18 13	18 32	18 53	19 6	19 20	19 37	19 57	20 7	20 18	20 31	20 46	21 4
24	17 57	18 14	18 32	18 54	19 6	19 20	19 37	19 58	20 8	20 19	20 31	20 46	21 4
25	17 57	18 14	18 33	18 54	19 6	19 21	19 37	19 58	20 8	20 19	20 32	20 46	21 4
26	17 57	18 15	18 33	18 54	19 7	19 21	19 38	19 58	20 8	20 19	20 32	20 47	21 4
27	17 58	18 15	18 34	18 55	19 7	19 21	19 38	19 58	20 8	20 19	20 32	20 47	21 4
28	17 58	18 16	18 34	18 55	19 7	19 21	19 38	19 59	20 8	20 19	20 32	20 47	21 4
29	17 59	18 16	18 34	18 56	19 8	19 22	19 38	19 59	20 8	20 20	20 32	20 46	21 4
30	17 59	18 17	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 19	20 32	20 46	21 3
31	18 0	18 17	18 35	18 56	19 8	19 22	19 38	19 59	20 8	20 19	20 32	20 46	21 3

LOCAL ASTRONOMICAL MEAN TIME OF SUNSET (SUN'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time.

To obtain the standard time at any station, increase the local time by the number of minutes the station is west of the standard meridian, or decrease the local time by the number of minutes the station is east of the standard meridian.

For sunset in southern latitudes see page 132.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 17	5 49	5 35	5 20	5 3	4 54	4 43	4 30	4 14	4 7	3 58	3 49	3 39	3 27
18	5 49	5 35	5 20	5 3	4 53	4 42	4 29	4 13	4 5	3 57	3 48	3 37	3 25
19	5 49	5 35	5 20	5 2	4 52	4 41	4 28	4 12	4 4	3 56	3 46	3 35	3 23
20	5 49	5 35	5 20	5 2	4 52	4 41	4 27	4 11	4 3	3 54	3 45	3 34	3 21
21	5 50	5 35	5 19	5 2	4 52	4 40	4 26	4 10	4 2	3 53	3 43	3 32	3 19
22	5 50	5 35	5 19	5 1	4 51	4 39	4 25	4 8	4 0	3 52	3 42	3 30	3 17
23	5 50	5 35	5 19	5 1	4 51	4 39	4 25	4 8	3 59	3 50	3 40	3 29	3 15
24	5 50	5 35	5 19	5 1	4 50	4 38	4 24	4 7	3 58	3 49	3 39	3 27	3 14
25	5 51	5 35	5 19	5 0	4 50	4 38	4 23	4 6	3 57	3 48	3 38	3 26	3 12
26	5 51	5 35	5 19	5 0	4 50	4 37	4 23	4 5	3 56	3 47	3 37	3 24	3 10
27	5 51	5 36	5 19	5 0	4 49	4 37	4 22	4 4	3 56	3 46	3 35	3 23	3 9
28	5 52	5 36	5 19	5 0	4 49	4 37	4 22	4 3	3 55	3 45	3 34	3 22	3 7
29	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 3	3 54	3 44	3 33	3 21	3 6
30	5 52	5 36	5 19	5 0	4 49	4 36	4 21	4 2	3 53	3 43	3 32	3 19	3 4
Dec. 1	5 53	5 36	5 19	5 0	4 48	4 36	4 20	4 1	3 52	3 43	3 31	3 18	3 3
2	5 53	5 37	5 20	5 0	4 48	4 35	4 20	4 1	3 52	3 42	3 30	3 17	3 2
3	5 54	5 37	5 20	5 0	4 48	4 35	4 20	4 0	3 51	3 41	3 30	3 16	3 1
4	5 54	5 37	5 20	5 0	4 48	4 35	4 19	4 0	3 51	3 40	3 29	3 15	3 0
5	5 54	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 40	3 28	3 15	2 59
6	5 55	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 50	3 39	3 28	3 14	2 58
7	5 55	5 38	5 20	5 0	4 48	4 35	4 19	3 59	3 49	3 39	3 27	3 13	2 57
8	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 59	3 49	3 38	3 26	3 13	2 56
9	5 56	5 39	5 21	5 0	4 48	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 55
10	5 57	5 39	5 21	5 1	4 49	4 35	4 18	3 58	3 49	3 38	3 26	3 12	2 55
11	5 57	5 40	5 22	5 1	4 49	4 35	4 18	3 58	3 49	3 38	3 25	3 11	2 54
12	5 58	5 40	5 22	5 1	4 49	4 35	4 19	3 58	3 49	3 38	3 25	3 11	2 54
13	5 58	5 41	5 22	5 1	4 49	4 35	4 19	3 58	3 49	3 38	3 25	3 11	2 54
14	5 58	5 41	5 23	5 2	4 50	4 35	4 19	3 58	3 49	3 38	3 25	3 10	2 53
15	5 59	5 42	5 23	5 2	4 50	4 36	4 19	3 59	3 49	3 38	3 25	3 10	2 53
16	5 59	5 42	5 24	5 2	4 50	4 36	4 19	3 59	3, 49	3 38	3 25	3 10	2 53
17	6 0	5 42	5 24	5 3	4 50	4 36	4 20	3 59	3 49	3 38	3 25	3 11	2 53
18	6 0	5 43	5 24	5 3	4 51	4 37	4 20	3 59	3 49	3 38	3 25	3 11	2 53
19	6 0	5 43	5 25	5 4	4 51	4 37	4 20	4 0	3 50	3 38	3 26	3 11	2 53
20	6 1	5 44	5 25	5 4	4 52	4 38	4 21	4 0	3 50	3 39	3 26	3 11	2 54
21	6 2	5 44	5 26	5 5	4 52	4 38	4 21	4 0	3 50	3 39	3 27	3 12	2 54
22	6 2	5 45	5 26	5 5	4 53	4 39	4 22	4 1	3 51	3 40	3 27	3 12	2 55
23	6 3	5 45	5 27	5 6	4 53	4 39	4 22	4 1	3 51	3 40	3 28	3 13	2 55
24	6 3	5 46	5 27	5 6	4 54	4 40	4 23	4 2	3 52	3 41	3 28	3 13	2 56
25	6 4	5 47	5 28	5 7	4 54	4 40	4 23	4 3	3 53	3 42	3 29	3 14	2 57
26	6 4	5 47	5 29	5 7	4 55	4 41	4 24	4 3	3 53	3 42	3 30	3 15	2 58
27	6 5	5 48	5 29	5 8	4 56	4 41	4 25	4 4	3 54	3 43	3 30	3 16	2 58
28	6 5	5 48	5 30	5 8	4 56	4 42	4 25	4 5	3 55	3 44	3 31	3 17	2 59
29	6 6	5 49	5 30	5 9	4 57	4 43	4 26	4 6	3 56	3 45	3 32	3 18	3 1
30	6 6	5 49	5 31	5 10	4 58	4 44	4 27	4 7	3 57	3 46	3 33	3 19	3 2
31	6 7	5 50	5 31	5 10	4 58	4 44	4 28	4 8	3 58	3 47	3 34	3 20	3 3
32	6 7	5 50	5 32	5 11	4 59	4 45	4 29	4 8	3 59	3 48	3 36	3 21	3 5

TABLE VII.

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1920.

In the case of a southern latitude the time of sunrise or sunset is taken from Table VI, with the corresponding northern latitude, not for the given date but for a date about six months earlier or later, which is to be found in the following table. The time taken from Table VI, whether of sunrise or of sunset, must be corrected by the quantity given in Table VII on the same line with the given date.

Example.—May 10, 1920, civil date, in latitude −38°, required the time of sunrise and sunset. The astronomical date is May 9 for sunrise and May 10 for sunset; Table VII gives November 11 and 12 as the corresponding dates, northern latitude, while the correction is +12^m in each case.

	Sunrise.				Sunset.			
	d	h	m		d	h	m	
Table VI, Lat. +38°	Nov. 11	18	37		Nov. 12	4	51	
Table VII	May 9	+	12		May 10	+	12	
Local astronomical mean time . .	May 9	18	49		May 10	5	3	
Civil time	May 10	6	49	A. M.	May 10	5	3	P. M.

Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.
		m			m			m			m
Jan. 0	July 1	−1	Feb. 5	Aug. 8	+ 9	Mar. 12	Sept. 14	+14	Apr. 17	Oct. 20	+15
1	2	0	6	9	9	13	15	14	18	21	15
2	3	0	7	10	9	14	16	15	19	22	15
3	4	0	8	11	9	15	17	15	20	23	14
4	5	0	9	12	10	16	18	15	21	24	14
5	6	+1	10	13	+10	17	19	+15	22	25	+14
6	7	1	11	14	10	18	20	15	23	26	14
7	8	1	12	15	10	19	21	15	24	27	14
8	9	2	13	16	10	20	22	15	25	28	14
9	10	2	14	17	10	21	23	15	26	29	14
10	11	+2	15	18	+11	22	24	+15	27	30	+14
11	12	2	16	19	11	23	25	15	28	31	14
12	13	3	17	20	11	24	26	15	29	Nov. 1	14
13	14	3	18	21	11	25	27	15	30	2	13
14	15	3	19	23	12	26	29	16	May 1	3	13
15	16	+4	20	24	+12	27	30	+16	2	4	+13
16	18	4	21	25	12	28	Oct. 1	16	3	5	13
17	19	4	22	26	12	29	2	16	4	6	13
18	20	4	23	27	12	30	3	16	5	7	13
19	21	4	24	28	12	31	4	16	6	8	13
20	22	+5	25	29	+13	Apr. 1	5	+16	7	9	+12
21	23	5	26	30	13	2	6	16	8	10	12
22	24	5	27	31	13	3	7	16	9	11	12
23	25	6	28	Sept. 1	13	4	8	15	10	12	12
24	26	6	29	2	13	5	9	15	11	13	12
25	27	+6	Mar. 1	3	+13	6	9	+15	12	14	+12
26	28	6	2	4	13	7	10	15	13	15	11
27	29	7	3	5	14	8	11	15	14	16	11
28	30	7	4	6	14	9	12	15	15	16	11
29	31	7	5	7	14	10	13	15	16	17	11
30	Aug. 1	+7	6	8	+14	11	14	+15	17	18	+11
31	3	8	7	9	14	12	15	15	18	19	11
Feb. 1	4	8	8	10	14	13	16	15	19	20	10
2	5	8	9	11	14	14	17	15	20	21	10
3	6	8	10	12	14	15	18	15	21	22	10
4	7	+8	11	13	+14	16	19	+15	22	23	+10

SUNRISE AND SUNSET FOR SOUTHERN LATITUDES, 1920.

Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.	Given Date.	Corresponding Date, Northern Latitude.	Correction.
		m			m			m			m
May 23	Nov. 24	+10	July 18	Jan. 16	− 4	Sept. 12	Mar. 10	−14	Nov. 7	May 5	−13
24	25	10	19	17	4	13	11	14	8	6	13
25	26	9	20	18	4	14	12	14	9	7	12
26	27	9	21	19	4	15	13	14	10	8	12
27	28	9	22	20	5	16	14	15	11	9	12
28	29	+ 9	23	21	− 5	17	15	−15	12	10	−12
29	30	8	24	22	5	18	16	15	13	11	12
30	Dec. 1	8	25	23	6	19	17	15	14	12	12
31	2	8	26	24	6	20	18	15	15	13	11
June 1	3	8	27	25	6	21	19	15	16	15	11
2	4	+ 8	28	26	− 6	22	20	−15	17	16	−11
3	4	8	29	27	7	23	21	15	18	17	11
4	5	7	30	28	7	24	22	15	19	18	11
5	6	7	31	29	7	25	23	15	20	19	10
6	7	7	Aug. 1	30	7	26	24	15	21	20	10
7	8	+ 6	2	31	− 8	27	25	−15	22	21	−10
8	9	6	3	31	8	28	26	15	23	22	10
9	10	6	4	Feb. 1	8	29	26	16	24	23	10
10	11	6	5	2	8	30	27	16	25	24	10
11	12	5	6	3	8	Oct. 1	28	16	26	25	9
12	13	+ 5	7	4	− 8	2	29	−16	27	26	− 9
13	14	5	8	5	9	3	30	16	28	27	9
14	15	5	9	6	9	4	31	16	29	28	9
15	16	4	10	7	9	5	Apr. 1	16	30	29	8
16	17	4	11	8	9	6	2	16	Dec. 1	30	8
17	18	+ 4	12	9	−10	7	3	−16	2	31	− 8
18	19	4	13	10	10	8	4	15	3	June 1	8
19	19	4	14	11	10	9	5	15	4	2	8
20	20	3	15	12	10	10	7	15	5	4	7
21	21	3	16	13	10	11	8	15	6	5	7
22	22	+ 3	17	14	−10	12	9	−15	7	6	− 7
23	23	3	18	15	11	13	10	15	8	7	6
24	24	2	19	16	11	14	11	15	9	8	6
25	25	2	20	17	11	15	12	15	10	9	6
26	26	2	21	18	11	16	13	15	11	10	6
27	27	+ 2	22	18	−12	17	14	−15	12	11	− 5
28	28	1	23	19	12	18	15	15	13	12	5
29	29	1	24	20	12	19	16	15	14	13	5
30	30	+ 1	25	21	12	20	17	15	15	14	5
July 1	Dec. 31	0	26	22	12	21	18	15	16	15	4
2	Jan. 1	0	27	23	−12	22	19	−15	17	16	− 4
3	2	0	28	24	12	23	20	14	18	17	4
4	3	0	29	25	13	24	21	14	19	18	4
5	4	0	30	26	13	25	22	14	20	20	3
6	5	− 1	31	27	13	26	23	14	21	21	3
7	6	− 1	Sept. 1	28	−13	27	24	−14	22	22	− 3
8	7	1	2	29	13	28	25	14	23	23	3
9	8	2	3	Mar. 1	13	29	26	14	24	24	2
10	9	2	4	2	13	30	27	14	25	25	2
11	10	2	5	3	14	31	28	14	26	26	2
12	11	− 2	6	4	−14	Nov. 1	29	−14	27	27	− 2
13	12	3	7	5	14	2	30	13	28	28	1
14	13	3	8	6	14	3	May 1	13	29	29	1
15	14	3	9	7	14	4	2	13	30	30	− 1
16	15	4	10	8	14	5	3	13	31	July 1	0
17	15	− 4	11	9	−14	6	4	−13	32	2	0

26455°—1920——10

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	0 56	0 47	0 38	0 27	0 21	0 13	0 5	....	....	....	....	....	23 50
1	1 51	1 39	1 26	1 12	1 3	0 54	0 42	0 29	0 23	0 16	0 8	0 0	....
2	2 50	2 35	2 20	2 2	1 52	1 40	1 27	1 10	1 2	0 54	0 44	0 33	0 21
3	3 51	3 35	3 19	2 59	2 48	2 35	2 20	2 1	1 52	1 43	1 32	1 19	1 4
4	4 54	4 38	4 21	4 2	3 51	3 38	3 22	3 3	2 54	2 44	2 33	2 20	2 5
5	5 57	5 42	5 26	5 9	4 58	4 46	4 32	4 15	4 7	3 58	3 48	3 36	3 22
6	6 56	6 44	6 31	6 16	6 8	5 58	5 46	5 32	5 25	5 18	5 10	5 0	4 50
7	7 52	7 43	7 34	7 23	7 16	7 9	7 1	6 50	6 46	6 40	6 34	6 28	6 20
8	8 44	8 39	8 33	8 26	8 23	8 18	8 13	8 7	8 4	8 1	7 57	7 54	7 49
9	9 34	9 32	9 30	9 27	9 26	9 24	9 23	9 21	9 20	9 18	9 17	9 16	9 14
10	10 20	10 22	10 24	10 26	10 27	10 28	10 30	10 31	10 32	10 33	10 34	10 35	10 37
11	11 6	11 11	11 16	11 22	11 26	11 29	11 34	11 40	11 42	11 45	11 48	11 52	11 56
12	11 50	11 58	12 7	12 17	12 22	12 29	12 37	12 46	12 50	12 55	13 0	13 6	13 12
13	12 35	12 46	12 58	13 11	13 18	13 27	13 38	13 50	13 56	14 2	14 9	14 17	14 27
14	13 21	13 34	13 48	14 4	14 13	14 24	14 36	14 52	14 59	15 7	15 15	15 26	15 38
15	14 8	14 22	14 38	14 56	15 7	15 19	15 33	15 51	15 59	16 8	16 19	16 30	16 44
16	14 55	15 11	15 28	15 47	15 58	16 11	16 27	16 45	16 54	17 4	17 15	17 28	17 44
17	15 44	16 0	16 16	16 36	16 47	17 0	17 16	17 35	17 44	17 54	18 5	18 18	18 33
18	16 32	16 47	17 4	17 22	17 33	17 46	18 0	18 18	18 26	18 36	18 46	18 58	19 12
19	17 21	17 35	17 49	18 6	18 16	18 27	18 40	18 56	19 3	19 11	19 20	19 31	19 43
20	18 9	18 20	18 33	18 47	18 55	19 4	19 15	19 28	19 34	19 41	19 48	19 57	20 6
21	18 56	19 5	19 14	19 25	19 31	19 38	19 47	19 56	20 1	20 6	20 11	20 18	20 24
22	19 42	19 48	19 54	20 2	20 6	20 10	20 16	20 22	20 25	20 28	20 31	20 36	20 40
23	20 29	20 31	20 34	20 37	20 39	20 41	20 43	20 46	20 47	20 48	20 50	20 52	20 54
24	21 15	21 14	21 13	21 12	21 12	21 11	21 10	21 9	21 9	21 8	21 8	21 8	21 7
25	22 3	21 58	21 54	21 49	21 46	21 42	21 38	21 34	21 32	21 29	21 27	21 24	21 21
26	22 52	22 45	22 36	22 27	22 22	22 16	22 9	22 0	21 56	21 52	21 48	21 42	21 37
27	23 44	23 34	23 22	23 9	23 1	22 53	22 43	22 31	22 25	22 19	22 12	22 5	21 56
28	....	....	....	23 56	23 46	23 35	23 23	23 7	23 0	22 52	22 44	22 34	22 22
29	0 40	0 26	0 12	....	....	....	....	23 52	23 44	23 35	23 24	23 12	22 58
30	1 38	1 22	1 6	0 48	0 37	0 24	0 10	....	....	....	....	....	23 49
31	2 38	2 22	2 5	1 46	1 34	1 21	1 6	0 47	0 38	0 28	0 17	0 4	....
Feb. 1	3 38	3 23	3 7	2 48	2 37	2 25	2 10	1 52	1 43	1 34	1 23	1 11	0 56
2	4 38	4 25	4 10	3 54	3 44	3 33	3 20	3 5	2 57	2 49	2 40	2 29	2 17
3	5 36	5 25	5 13	5 0	4 53	4 44	4 34	4 22	4 16	4 9	4 2	3 54	3 45
4	6 30	6 22	6 14	6 5	6 0	5 54	5 47	5 39	5 35	5 30	5 26	5 21	5 15
5	7 21	7 17	7 13	7 8	7 6	7 3	6 59	6 55	6 53	6 50	6 48	6 46	6 43
6	8 10	8 10	8 9	8 9	8 9	8 9	8 9	8 8	8 8	8 8	8 8	8 8	8 8
7	8 57	9 0	9 4	9 8	9 10	9 13	9 16	9 19	9 21	9 23	9 25	9 28	9 30
8	9 43	9 50	9 57	10 5	10 9	10 14	10 21	10 28	10 32	10 35	10 40	10 44	10 50
9	10 29	10 38	10 49	11 0	11 7	11 15	11 24	11 34	11 40	11 45	11 52	11 58	12 6
10	11 15	11 28	11 40	11 54	12 3	12 13	12 24	12 38	12 45	12 52	13 0	13 10	13 20
11	12 2	12 16	12 30	12 48	12 58	13 9	13 22	13 39	13 47	13 55	14 5	14 16	14 29
12	12 49	13 4	13 20	13 39	13 50	14 3	14 17	14 35	14 44	14 54	15 4	15 17	15 31
13	13 37	13 53	14 10	14 29	14 40	14 53	15 8	15 27	15 36	15 46	15 57	16 10	16 25
14	14 26	14 41	14 57	15 16	15 27	15 40	15 55	16 13	16 22	16 31	16 42	16 54	17 9
15	15 14	15 28	15 43	16 1	16 11	16 23	16 36	16 53	17 1	17 9	17 19	17 30	17 42
16	16 2	16 14	16 28	16 43	16 52	17 2	17 13	17 28	17 34	17 41	17 50	17 59	18 9

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Jan. 0	13 22	13 33	13 44	13 57	14 4	14 13	14 23	14 35	14 41	14 47	14 54	15 2	15 11
1	14 18	14 32	14 46	15 3	15 12	15 23	15 36	15 52	15 59	16 7	16 16	16 26	16 39
2	15 18	15 34	15 50	16 9	16 20	16 32	16 48	17 6	17 14	17 24	17 35	17 47	18 2
3	16 21	16 37	16 54	17 14	17 25	17 38	17 54	18 13	18 22	18 32	18 43	18 56	19 12
4	17 24	17 39	17 56	18 14	18 25	18 38	18 52	19 10	19 19	19 28	19 38	19 50	20 4
5	18 25	18 39	18 53	19 9	19 19	19 29	19 42	19 57	20 4	20 12	20 21	20 30	20 42
6	19 23	19 34	19 45	19 58	20 5	20 14	20 23	20 35	20 40	20 46	20 52	21 0	21 8
7	20 18	20 25	20 32	20 41	20 46	20 52	20 58	21 6	21 10	21 13	21 18	21 22	21 28
8	21 8	21 12	21 16	21 20	21 23	21 26	21 29	21 33	21 34	21 36	21 38	21 41	21 43
9	21 56	21 56	21 57	21 57	21 57	21 57	21 57	21 57	21 57	21 57	21 57	21 57	21 57
10	22 42	22 39	22 36	22 32	22 29	22 27	22 24	22 20	22 19	22 17	22 15	22 13	22 10
11	23 27	23 21	23 14	23 6	23 2	22 57	22 51	22 44	22 40	22 37	22 33	22 29	22 24
12	....	....	23 53	23 42	23 35	23 28	23 19	23 9	23 4	22 59	22 53	22 46	22 39
13	0 12	0 3	....	....	....	....	23 50	23 36	23 30	23 23	23 16	23 7	22 57
14	0 58	0 46	0 33	0 19	0 10	0 1	....	....	....	23 52	23 43	23 32	23 20
15	1 44	1 30	1 15	0 58	0 48	0 37	0 24	0 8	0 1	....	....	....	23 50
16	2 31	2 16	1 59	1 41	1 30	1 17	1 3	0 45	0 36	0 27	0 16	0 4	....
17	3 19	3 3	2 46	2 27	2 15	2 2	1 47	1 28	1 19	1 9	0 57	0 44	0 29
18	4 7	3 52	3 35	3 16	3 4	2 52	2 36	2 18	2 9	1 59	1 48	1 35	1 20
19	4 56	4 41	4 26	4 8	3 57	3 45	3 31	3 14	3 5	2 56	2 46	2 34	2 20
20	5 44	5 31	5 18	5 2	4 53	4 42	4 30	4 15	4 8	4 0	3 51	3 41	3 30
21	6 32	6 21	6 10	5 57	5 50	5 42	5 32	5 20	5 14	5 8	5 1	4 53	4 44
22	7 18	7 11	7 3	6 54	6 48	6 42	6 35	6 27	6 23	6 18	6 14	6 8	6 2
23	8 5	8 0	7 56	7 51	7 48	7 44	7 40	7 35	7 33	7 30	7 28	7 25	7 21
24	8 51	8 50	8 49	8 48	8 47	8 47	8 46	8 45	8 44	8 44	8 43	8 43	8 42
25	9 38	9 40	9 43	9 46	9 48	9 50	9 53	9 56	9 57	9 59	10 0	10 2	10 4
26	10 26	10 32	10 39	10 46	10 51	10 56	11 1	11 8	11 11	11 15	11 19	11 23	11 28
27	11 17	11 26	11 36	11 48	11 54	12 2	12 11	12 22	12 27	12 32	12 38	12 45	12 53
28	12 10	12 23	12 36	12 51	13 0	13 10	13 22	13 36	13 42	13 50	13 58	14 8	14 19
29	13 7	13 21	13 37	13 55	14 5	14 17	14 31	14 48	14 56	15 5	15 16	15 27	15 40
30	14 6	14 22	14 39	14 58	15 9	15 22	15 37	15 56	16 5	16 15	16 26	16 39	16 54
31	15 7	15 22	15 39	15 58	16 10	16 22	16 37	16 56	17 5	17 14	17 25	17 38	17 52
Feb. 1	16 7	16 22	16 37	16 55	17 5	17 16	17 30	17 47	17 54	18 3	18 13	18 24	18 36
2	17 6	17 18	17 31	17 46	17 54	18 3	18 15	18 28	18 34	18 41	18 49	18 58	19 7
3	18 2	18 11	18 20	18 31	18 37	18 45	18 53	19 3	19 7	19 12	19 18	19 24	19 30
4	18 54	19 0	19 6	19 13	19 17	19 21	19 26	19 32	19 34	19 38	19 41	19 44	19 48
5	19 44	19 47	19 49	19 51	19 52	19 54	19 56	19 58	19 59	20 0	20 1	20 2	20 4
6	20 33	20 31	20 30	20 28	20 27	20 25	20 24	20 22	20 22	20 21	20 20	20 19	20 18
7	21 19	21 14	21 9	21 3	21 0	20 56	20 52	20 46	20 44	20 41	20 38	20 35	20 32
8	22 5	21 57	21 49	21 39	21 34	21 27	21 20	21 11	21 7	21 3	20 58	20 52	20 46
9	22 51	22 41	22 29	22 16	22 9	22 0	21 50	21 38	21 33	21 27	21 20	21 12	21 4
10	23 38	23 25	23 11	22 55	22 46	22 36	22 23	22 9	22 2	21 54	21 46	21 36	21 25
11	....	....	23 55	23 37	23 26	23 15	23 0	22 44	22 36	22 27	22 16	22 5	21 52
12	0 25	0 10	....	....	....	23 57	23 42	23 24	23 16	23 6	22 55	22 42	22 28
13	1 12	0 57	0 40	0 21	0 10	....	....	....	....	23 52	23 41	23 28	23 13
14	2 1	1 45	1 28	1 9	0 58	0 45	0 30	0 11	0 2	....	....	....	....
15	2 49	2 34	2 18	2 0	1 49	1 36	1 22	1 4	0 56	0 46	0 36	0 23	0 9
16	3 37	3 24	3 9	2 53	2 43	2 32	2 19	2 3	1 55	1 47	1 38	1 27	1 15

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	16 2	16 14	16 28	16 43	16 52	17 2	17 13	17 28	17 34	17 41	17 50	17 59	18 9
17	16 50	17 0	17 10	17 23	17 30	17 37	17 47	17 58	18 3	18 9	18 15	18 22	18 30
18	17 37	17 44	17 52	18 0	18 5	18 11	18 17	18 25	18 29	18 32	18 37	18 42	18 47
19	18 24	18 28	18 32	18 37	18 40	18 43	18 46	18 50	18 52	18 54	18 56	18 59	19 2
20	19 12	19 12	19 13	19 13	19 14	19 14	19 14	19 15	19 15	19 15	19 15	19 16	19 16
21	20 0	19 57	19 54	19 50	19 49	19 46	19 43	19 40	19 38	19 36	19 34	19 32	19 30
22	20 50	20 43	20 36	20 28	20 24	20 19	20 13	20 6	20 3	20 0	19 55	19 51	19 46
23	21 42	21 32	21 21	21 10	21 2	20 55	20 46	20 35	20 30	20 25	20 19	20 12	20 5
24	22 36	22 23	22 10	21 55	21 46	21 36	21 24	21 10	21 4	20 57	20 48	20 39	20 29
25	23 32	23 18	23 2	22 44	22 34	22 22	22 9	21 52	21 44	21 35	21 26	21 14	21 2
26	....	....	23 58	23 39	23 28	23 15	23 0	22 42	22 33	22 24	22 13	22 0	21 46
27	0 30	0 15	....	....	....	....	....	23 42	23 33	23 23	23 12	23 0	22 46
28	1 29	1 14	0 58	0 38	0 28	0 15	0 0	....	....	....	....	....	23 59
29	2 28	2 13	1 58	1 41	1 31	1 19	1 6	0 49	0 41	0 33	0 23	0 12	....
Mar. 1	3 24	3 12	2 59	2 45	2 36	2 27	2 16	2 2	1 55	1 48	1 40	1 31	1 21
2	4 18	4 9	4 0	3 49	3 42	3 35	3 27	3 17	3 12	3 7	3 1	2 55	2 48
3	5 10	5 4	4 58	4 52	4 48	4 43	4 38	4 32	4 29	4 26	4 22	4 19	4 14
4	5 59	5 57	5 55	5 53	5 51	5 49	5 48	5 46	5 45	5 44	5 42	5 41	5 39
5	6 47	6 48	6 50	6 52	6 53	6 54	6 56	6 58	6 58	6 59	7 0	7 1	7 3
6	7 34	7 39	7 44	7 50	7 54	7 58	8 2	8 8	8 10	8 13	8 16	8 20	8 24
7	8 21	8 29	8 37	8 47	8 53	8 59	9 7	9 16	9 20	9 25	9 30	9 36	9 43
8	9 7	9 18	9 30	9 42	9 50	9 59	10 9	10 22	10 28	10 34	10 41	10 49	10 59
9	9 54	10 7	10 21	10 37	10 46	10 57	11 9	11 25	11 32	11 40	11 48	11 59	12 10
10	10 42	10 56	11 12	11 30	11 40	11 52	12 6	12 23	12 32	12 41	12 51	13 3	13 16
11	11 30	11 45	12 1	12 20	12 31	12 44	12 59	13 17	13 26	13 36	13 46	13 59	14 14
12	12 18	12 33	12 49	13 8	13 19	13 32	13 47	14 5	14 14	14 24	14 34	14 47	15 1
13	13 6	13 20	13 36	13 54	14 4	14 16	14 30	14 48	14 56	15 4	15 15	15 26	15 39
14	13 54	14 7	14 21	14 37	14 47	14 57	15 9	15 24	15 31	15 39	15 48	15 58	16 9
15	14 41	14 52	15 4	15 17	15 25	15 34	15 44	15 56	16 2	16 8	16 15	16 23	16 32
16	15 28	15 37	15 46	15 56	16 2	16 8	16 16	16 25	16 29	16 34	16 39	16 44	16 51
17	16 16	16 21	16 26	16 33	16 36	16 41	16 46	16 51	16 54	16 56	17 0	17 3	17 7
18	17 3	17 5	17 7	17 10	17 11	17 12	17 14	17 16	17 17	17 18	17 19	17 21	17 22
19	17 52	17 50	17 49	17 47	17 46	17 44	17 43	17 41	17 41	17 40	17 39	17 38	17 37
20	18 42	18 37	18 32	18 25	18 22	18 18	18 14	18 8	18 6	18 3	18 0	17 56	17 53
21	19 35	19 26	19 17	19 7	19 1	18 54	18 47	18 38	18 33	18 28	18 24	18 18	18 11
22	20 30	20 18	20 6	19 52	19 44	19 35	19 24	19 11	19 5	18 59	18 52	18 44	18 34
23	21 27	21 13	20 58	20 42	20 32	20 21	20 8	19 52	19 44	19 36	19 27	19 17	19 5
24	22 26	22 10	21 54	21 36	21 25	21 12	20 58	20 40	20 32	20 22	20 12	20 0	19 46
25	23 25	23 9	22 53	22 34	22 23	22 10	21 55	21 37	21 28	21 19	21 8	20 56	20 41
26	....	....	23 53	23 35	23 25	23 13	22 59	22 42	22 34	22 25	22 15	22 3	21 50
27	0 23	0 8	....	....	....	....	....	23 52	23 45	23 38	23 29	23 20	23 9
28	1 19	1 6	0 53	0 38	0 29	0 19	0 7	....	....	....	....	....	....
29	2 12	2 3	1 52	1 40	1 33	1 25	1 16	1 5	1 0	0 54	0 47	0 40	0 32
30	3 4	2 57	2 50	2 42	2 37	2 32	2 25	2 18	2 14	2 11	2 6	2 2	1 56
31	3 52	3 49	3 46	3 42	3 39	3 37	3 34	3 30	3 28	3 27	3 25	3 22	3 20
Apr. 1	4 40	4 40	4 40	4 41	4 41	4 41	4 41	4 41	4 41	4 42	4 42	4 42	4 42
2	5 27	5 30	5 34	5 38	5 41	5 44	5 47	5 51	5 53	5 55	5 57	5 59	6 2

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Feb. 16	3 37	3 24	3 9	2 53	2 43	2 32	2 19	2 3	1 55	1 47	1 38	1 27	1 15
17	4 25	4 14	4 2	3 48	3 40	3 30	3 20	3 6	3 0	2 53	2 46	2 37	2 27
18	5 13	5 4	4 55	4 44	4 38	4 31	4 23	4 13	4 8	4 3	3 57	3 51	3 44
19	6 0	5 54	5 48	5 42	5 38	5 33	5 28	5 22	5 19	5 16	5 12	5 8	5 4
20	6 47	6 45	6 43	6 40	6 38	6 36	6 34	6 32	6 31	6 30	6 28	6 27	6 25
21	7 35	7 36	7 38	7 39	7 40	7 41	7 42	7 44	7 45	7 45	7 46	7 47	7 48
22	8 24	8 28	8 34	8 40	8 43	8 47	8 52	8 57	9 0	9 2	9 5	9 9	9 13
23	9 14	9 23	9 32	9 42	9 47	9 54	10 2	10 11	10 16	10 20	10 26	10 32	10 38
24	10 7	10 19	10 31	10 44	10 52	11 2	11 12	11 25	11 32	11 38	11 46	11 54	12 4
25	11 2	11 16	11 31	11 48	11 57	12 9	12 22	12 38	12 46	12 54	13 4	13 14	13 27
26	12 0	12 15	12 31	12 50	13 1	13 14	13 28	13 46	13 55	14 4	14 15	14 27	14 42
27	12 58	13 14	13 31	13 50	14 1	14 14	14 29	14 48	14 56	15 6	15 17	15 30	15 44
28	13 57	14 12	14 28	14 46	14 57	15 9	15 23	15 40	15 48	15 57	16 7	16 19	16 32
29	14 55	15 8	15 22	15 37	15 46	15 57	16 9	16 24	16 31	16 38	16 46	16 56	17 7
Mar. 1	15 50	16 0	16 12	16 24	16 31	16 39	16 49	17 0	17 5	17 11	17 18	17 25	17 33
2	16 43	16 50	16 58	17 6	17 11	17 17	17 23	17 31	17 35	17 38	17 42	17 47	17 52
3	17 33	17 37	17 41	17 46	17 48	17 51	17 54	17 58	18 0	18 2	18 4	18 6	18 9
4	18 22	18 22	18 23	18 23	18 23	18 23	18 23	18 23	18 24	18 24	18 24	18 24	18 24
5	19 10	19 6	19 3	18 59	18 57	18 54	18 51	18 48	18 46	18 45	18 43	18 40	18 38
6	19 56	19 50	19 43	19 35	19 31	19 26	19 20	19 13	19 10	19 6	19 2	18 58	18 53
7	20 43	20 34	20 24	20 12	20 6	19 58	19 50	19 40	19 35	19 29	19 24	19 17	19 10
8	21 30	21 18	21 6	20 51	20 43	20 33	20 22	20 9	20 3	19 56	19 48	19 39	19 30
9	22 17	22 4	21 49	21 32	21 22	21 11	20 58	20 42	20 35	20 26	20 17	20 7	19 55
10	23 5	22 50	22 34	22 16	22 5	21 53	21 38	21 21	21 12	21 3	20 52	20 41	20 27
11	23 53	23 38	23 21	23 2	22 51	22 38	22 23	22 5	21 56	21 46	21 35	21 23	21 8
12	....	....	....	23 51	23 40	23 28	23 13	22 55	22 46	22 37	22 26	22 14	21 59
13	0 41	0 26	0 10	....	....	....	....	23 51	23 43	23 34	23 24	23 13	23 0
14	1 29	1 15	1 0	0 43	0 33	0 21	0 7	....	....	....	....	....	....
15	2 16	2 4	1 51	1 36	1 27	1 18	1 6	0 51	0 45	0 37	0 29	0 19	0 9
16	3 4	2 54	2 44	2 32	2 25	2 17	2 7	1 56	1 51	1 45	1 38	1 31	1 23
17	3 51	3 44	3 37	3 28	3 24	3 18	3 11	3 3	3 0	2 56	2 51	2 46	2 41
18	4 38	4 35	4 31	4 26	4 24	4 21	4 17	4 13	4 11	4 9	4 7	4 4	4 2
19	5 26	5 26	5 26	5 26	5 26	5 26	5 26	5 25	5 25	5 25	5 25	5 25	5 25
20	6 16	6 19	6 23	6 27	6 30	6 32	6 35	6 39	6 41	6 43	6 45	6 47	6 50
21	7 7	7 14	7 22	7 30	7 35	7 40	7 47	7 55	7 58	8 2	8 7	8 12	8 17
22	8 1	8 11	8 22	8 34	8 42	8 50	8 59	9 11	9 16	9 23	9 29	9 37	9 45
23	8 57	9 10	9 23	9 39	9 48	9 59	10 11	10 26	10 33	10 41	10 50	11 0	11 11
24	9 55	10 9	10 25	10 43	10 54	11 6	11 20	11 37	11 46	11 55	12 5	12 17	12 31
25	10 54	11 9	11 26	11 45	11 56	12 8	12 23	12 42	12 50	13 0	13 11	13 23	13 38
26	11 53	12 8	12 24	12 42	12 53	13 5	13 19	13 37	13 45	13 54	14 4	14 16	14 30
27	12 50	13 3	13 18	13 34	13 44	13 54	14 7	14 22	14 30	14 38	14 47	14 56	15 8
28	13 45	13 56	14 8	14 21	14 29	14 38	14 48	15 0	15 6	15 12	15 19	15 27	15 36
29	14 37	14 45	14 54	15 4	15 10	15 16	15 24	15 32	15 37	15 41	15 46	15 52	15 58
30	15 27	15 32	15 37	15 43	15 47	15 51	15 55	16 0	16 3	16 5	16 8	16 11	16 15
31	16 15	16 17	16 19	16 20	16 22	16 23	16 24	16 26	16 26	16 27	16 28	16 29	16 30
Apr. 1	17 2	17 1	16 59	16 56	16 55	16 54	16 52	16 50	16 49	16 48	16 47	16 46	16 44
2	17 49	17 44	17 38	17 32	17 29	17 25	17 20	17 15	17 12	17 9	17 6	17 3	16 59

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	4 40	4 40	4 40	4 41	4 41	4 41	4 41	4 41	4 41	4 42	4 42	4 42	4 42
2	5 27	5 30	5 34	5 38	5 41	5 44	5 47	5 51	5 53	5 55	5 57	5 59	6 2
3	6 13	6 20	6 27	6 35	6 40	6 45	6 52	6 59	7 3	7 7	7 11	7 16	7 21
4	7 0	7 9	7 20	7 31	7 38	7 46	7 55	8 6	8 11	8 17	8 23	8 30	8 38
5	7 47	7 59	8 12	8 26	8 35	8 45	8 56	9 10	9 17	9 24	9 32	9 42	9 52
6	8 34	8 48	9 3	9 20	9 30	9 41	9 55	10 11	10 19	10 27	10 37	10 48	11 1
7	9 22	9 37	9 53	10 12	10 22	10 35	10 49	11 7	11 16	11 25	11 36	11 48	12 2
8	10 10	10 26	10 42	11 1	11 12	11 24	11 40	11 58	12 6	12 16	12 27	12 39	12 54
9	10 58	11 13	11 29	11 47	11 58	12 10	12 25	12 42	12 50	13 0	13 10	13 22	13 36
10	11 46	12 0	12 14	12 31	12 41	12 52	13 5	13 20	13 28	13 36	13 45	13 56	14 8
11	12 33	12 45	12 57	13 12	13 20	13 30	13 41	13 54	14 0	14 7	14 15	14 24	14 33
12	13 19	13 29	13 39	13 50	13 57	14 4	14 13	14 24	14 28	14 34	14 40	14 46	14 54
13	14 6	14 12	14 19	14 27	14 32	14 37	14 43	14 50	14 54	14 57	15 1	15 6	15 11
14	14 52	14 56	15 0	15 4	15 6	15 9	15 12	15 16	15 18	15 19	15 21	15 24	15 26
15	15 40	15 40	15 40	15 40	15 40	15 41	15 41	15 41	15 41	15 41	15 41	15 41	15 41
16	16 30	16 26	16 23	16 18	16 16	16 14	16 11	16 7	16 5	16 3	16 1	15 59	15 56
17	17 22	17 15	17 8	16 59	16 54	16 49	16 43	16 35	16 32	16 28	16 24	16 19	16 14
18	18 17	18 7	17 56	17 44	17 36	17 28	17 19	17 8	17 2	16 57	16 50	16 44	16 36
19	19 15	19 2	18 48	18 32	18 23	18 13	18 1	17 46	17 39	17 32	17 24	17 14	17 4
20	20 15	20 0	19 44	19 26	19 16	19 4	18 50	18 33	18 25	18 16	18 6	17 55	17 42
21	21 16	21 0	20 44	20 25	20 14	20 2	19 47	19 29	19 20	19 10	19 0	18 48	18 33
22	22 16	22 1	21 46	21 27	21 17	21 5	20 50	20 33	20 25	20 16	20 5	19 53	19 40
23	23 14	23 1	22 47	22 31	22 22	22 11	21 58	21 43	21 36	21 28	21 19	21 9	20 57
24	....	23 58	23 47	23 34	23 27	23 18	23 8	22 56	22 50	22 44	22 37	22 29	22 20
25	0 9	....	....	....	....	....	....	....	....	....	23 56	23 50	23 44
26	1 1	0 54	0 45	0 36	0 31	0 25	0 18	0 9	0 5	0 1	....	....	....
27	1 50	1 46	1 41	1 36	1 33	1 30	1 26	1 21	1 19	1 16	1 14	1 11	1 7
28	2 37	2 36	2 35	2 34	2 34	2 33	2 32	2 31	2 31	2 30	2 30	2 29	2 28
29	3 23	3 26	3 28	3 32	3 33	3 35	3 37	3 40	3 41	3 43	3 44	3 46	3 48
30	4 9	4 15	4 21	4 28	4 32	4 36	4 42	4 48	4 51	4 54	4 58	5 2	5 6
May 1	4 55	5 4	5 13	5 23	5 29	5 36	5 44	5 54	5 59	6 4	6 9	6 16	6 23
2	5 41	5 53	6 4	6 18	6 26	6 35	6 46	6 59	7 5	7 12	7 19	7 27	7 37
3	6 29	6 42	6 56	7 12	7 22	7 32	7 45	8 1	8 8	8 16	8 25	8 36	8 48
4	7 16	7 31	7 47	8 5	8 15	8 27	8 41	8 59	9 7	9 16	9 26	9 38	9 52
5	8 5	8 20	8 36	8 55	9 6	9 18	9 33	9 51	10 0	10 10	10 20	10 33	10 47
6	8 53	9 8	9 24	9 42	9 53	10 6	10 20	10 38	10 47	10 56	11 6	11 19	11 33
7	9 40	9 54	10 10	10 27	10 37	10 49	11 2	11 19	11 26	11 35	11 45	11 56	12 8
8	10 27	10 40	10 53	11 8	11 17	11 27	11 39	11 54	12 0	12 8	12 16	12 25	12 36
9	11 13	11 23	11 35	11 47	11 55	12 3	12 13	12 24	12 30	12 36	12 42	12 50	12 58
10	11 58	12 6	12 15	12 24	12 30	12 36	12 43	12 51	12 55	13 0	13 4	13 10	13 16
11	12 44	12 49	12 54	13 0	13 3	13 7	13 11	13 17	13 19	13 22	13 24	13 28	13 31
12	13 30	13 32	13 33	13 35	13 36	13 38	13 39	13 41	13 42	13 43	13 44	13 45	13 46
13	14 18	14 16	14 14	14 12	14 10	14 9	14 8	14 6	14 5	14 4	14 3	14 2	14 1
14	15 7	15 2	14 56	14 50	14 46	14 42	14 38	14 32	14 30	14 27	14 24	14 20	14 17
15	16 0	15 52	15 42	15 32	15 26	15 19	15 11	15 2	14 58	14 53	14 48	14 42	14 36
16	16 57	16 45	16 33	16 18	16 10	16 1	15 50	15 38	15 32	15 25	15 18	15 10	15 0
17	17 57	17 43	17 28	17 11	17 1	16 50	16 37	16 21	16 13	16 5	15 56	15 45	15 33

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Apr. 1	17 2	17 1	16 59	16 56	16 55	16 54	16 52	16 50	16 49	16 48	16 47	16 46	16 44
2	17 49	17 44	17 38	17 32	17 29	17 25	17 20	17 15	17 12	17 9	17 6	17 3	16 59
3	18 36	18 27	18 19	18 9	18 4	17 57	17 50	17 41	17 36	17 32	17 27	17 21	17 15
4	19 22	19 12	19 0	18 47	18 40	18 31	18 21	18 9	18 3	17 57	17 50	17 43	17 34
5	20 10	19 57	19 43	19 27	19 18	19 8	18 55	18 41	18 34	18 26	18 18	18 8	17 57
6	20 58	20 43	20 28	20 10	20 0	19 48	19 34	19 18	19 9	19 0	18 51	18 40	18 26
7	21 46	21 30	21 14	20 56	20 44	20 32	20 17	19 59	19 51	19 41	19 31	19 18	19 4
8	22 34	22 19	22 2	21 44	21 33	21 20	21 5	20 47	20 39	20 29	20 18	20 6	19 51
9	23 22	23 7	22 52	22 34	22 24	22 12	21 58	21 40	21 32	21 23	21 13	21 2	20 48
10	....	23 56	23 42	23 26	23 17	23 6	22 54	22 38	22 31	22 23	22 14	22 4	21 53
11	0 9	....	....	....	....	....	23 53	23 40	23 35	23 28	23 21	23 13	23 4
12	0 55	0 44	0 33	0 20	0 12	0 3	....	....	....	....	....	....	....
13	1 42	1 33	1 25	1 15	1 9	1 2	0 55	0 45	0 41	0 36	0 31	0 25	0 18
14	2 28	2 23	2 17	2 11	2 8	2 3	1 59	1 53	1 50	1 47	1 44	1 40	1 36
15	3 15	3 13	3 12	3 9	3 8	3 6	3 5	3 3	3 2	3 1	3 0	2 58	2 57
16	4 4	4 5	4 7	4 9	4 10	4 12	4 14	4 15	4 16	4 17	4 18	4 19	4 21
17	4 54	5 0	5 5	5 12	5 15	5 20	5 25	5 30	5 33	5 36	5 40	5 43	5 47
18	5 48	5 56	6 6	6 16	6 23	6 30	6 38	6 48	6 52	6 57	7 3	7 9	7 16
19	6 44	6 56	7 8	7 23	7 31	7 41	7 52	8 6	8 12	8 19	8 27	8 36	8 46
20	7 43	7 57	8 12	8 29	8 39	8 51	9 4	9 21	9 29	9 37	9 47	9 58	10 11
21	8 44	8 59	9 16	9 34	9 45	9 58	10 12	10 30	10 39	10 48	10 59	11 11	11 26
22	9 45	10 0	10 16	10 35	10 46	10 58	11 13	11 31	11 39	11 48	11 59	12 11	12 25
23	10 44	10 58	11 13	11 30	11 40	11 51	12 4	12 21	12 28	12 36	12 46	12 56	13 8
24	11 41	11 53	12 5	12 20	12 28	12 37	12 48	13 1	13 8	13 14	13 22	13 30	13 40
25	12 34	12 43	12 53	13 4	13 10	13 17	13 25	13 35	13 40	13 45	13 50	13 56	14 3
26	13 25	13 31	13 37	13 44	13 48	13 52	13 58	14 4	14 7	14 10	14 14	14 17	14 22
27	14 13	14 16	14 18	14 21	14 23	14 25	14 27	14 30	14 31	14 33	14 34	14 36	14 38
28	15 0	14 59	14 58	14 57	14 57	14 56	14 55	14 54	14 54	14 54	14 53	14 52	14 52
29	15 45	15 41	15 37	15 32	15 29	15 26	15 23	15 18	15 16	15 14	15 12	15 9	15 6
30	16 31	16 24	16 17	16 8	16 3	15 57	15 51	15 43	15 40	15 36	15 31	15 27	15 21
May 1	17 17	17 8	16 57	16 45	16 38	16 30	16 21	16 10	16 5	16 0	15 54	15 47	15 39
2	18 4	17 52	17 39	17 24	17 16	17 6	16 54	16 41	16 34	16 27	16 19	16 10	16 0
3	18 52	18 38	18 23	18 6	17 56	17 45	17 32	17 16	17 8	17 0	16 50	16 39	16 27
4	19 40	19 25	19 9	18 51	18 40	18 27	18 13	17 55	17 47	17 38	17 27	17 15	17 1
5	20 28	20 13	19 57	19 38	19 27	19 14	18 59	18 41	18 33	18 23	18 12	18 0	17 45
6	21 16	21 1	20 45	20 27	20 16	20 4	19 50	19 32	19 24	19 15	19 4	18 52	18 39
7	22 3	21 50	21 35	21 18	21 9	20 58	20 45	20 29	20 21	20 13	20 3	19 53	19 40
8	22 50	22 38	22 25	22 11	22 3	21 53	21 42	21 28	21 22	21 15	21 7	20 58	20 48
9	23 35	23 26	23 16	23 5	22 58	22 51	22 42	22 31	22 26	22 21	22 15	22 8	22 0
10	....	....	....	23 59	23 55	23 49	23 43	23 36	23 33	23 29	23 25	23 20	23 15
11	0 20	0 14	0 7	....	....	....	....	....	....	....	....	....	....
12	1 6	1 3	0 59	0 55	0 53	0 50	0 47	0 43	0 42	0 40	0 38	0 35	0 33
13	1 52	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53	1 53
14	2 41	2 44	2 48	2 53	2 55	2 58	3 1	3 5	3 7	3 9	3 11	3 13	3 16
15	3 32	3 39	3 47	3 55	4 0	4 6	4 12	4 20	4 24	4 28	4 33	4 37	4 43
16	4 27	4 37	4 48	5 0	5 8	5 16	5 26	5 38	5 43	5 49	5 56	6 4	6 12
17	5 25	5 38	5 52	6 8	6 17	6 27	6 40	6 55	7 3	7 10	7 19	7 30	7 41

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May	17	17 57	17 43	17 28	17 11	17 1	16 50	16 37	16 21	16 13	16 5	15 56	15 45	15 33
	18	18 59	18 44	18 28	18 9	17 58	17 46	17 31	17 13	17 5	16 56	16 45	16 33	16 19
	19	20 2	19 47	19 31	19 12	19 1	18 49	18 34	18 16	18 8	17 58	17 47	17 35	17 21
	20	21 3	20 50	20 34	20 17	20 8	19 56	19 43	19 27	19 19	19 10	19 0	18 50	18 37
	21	22 2	21 50	21 38	21 24	21 15	21 6	20 55	20 41	20 35	20 28	20 20	20 12	20 2
	22	22 56	22 48	22 38	22 28	22 22	22 15	22 8	21 57	21 52	21 47	21 42	21 35	21 28
	23	23 47	23 42	23 36	23 30	23 26	23 22	23 17	23 11	23 8	23 5	23 1	22 58	22 54
	24	....	....	....	....	....	....	....	....	....	....	....	....	....
	25	0 36	0 34	0 32	0 29	0 28	0 26	0 24	0 22	0 21	0 20	0 19	0 18	0 16
	26	1 22	1 24	1 25	1 27	1 28	1 29	1 30	1 32	1 33	1 33	1 34	1 35	1 37
	27	2 8	2 12	2 17	2 22	2 26	2 30	2 34	2 40	2 42	2 45	2 48	2 51	2 55
	28	2 53	3 1	3 9	3 18	3 24	3 30	3 37	3 46	3 50	3 54	4 0	4 5	4 11
	29	3 39	3 49	4 0	4 13	4 20	4 29	4 39	4 50	4 56	5 2	5 9	5 17	5 26
	30	4 25	4 38	4 51	5 7	5 16	5 26	5 38	5 53	6 0	6 8	6 16	6 26	6 37
	31	5 13	5 27	5 42	6 0	6 10	6 22	6 35	6 52	7 0	7 9	7 19	7 30	7 44
June	1	6 1	6 16	6 32	6 50	7 2	7 14	7 29	7 47	7 55	8 5	8 16	8 28	8 42
	2	6 49	7 4	7 20	7 39	7 50	8 2	8 17	8 36	8 44	8 54	9 4	9 17	9 31
	3	7 36	7 51	8 7	8 25	8 35	8 47	9 1	9 18	9 26	9 35	9 45	9 57	10 10
	4	8 24	8 37	8 51	9 7	9 17	9 27	9 40	9 55	10 2	10 10	10 19	10 29	10 40
	5	9 10	9 21	9 33	9 47	9 55	10 4	10 14	10 27	10 33	10 40	10 47	10 55	11 4
	6	9 55	10 4	10 13	10 24	10 30	10 37	10 45	10 55	11 0	11 4	11 9	11 16	11 23
	7	10 40	10 46	10 52	10 59	11 4	11 8	11 14	11 20	11 23	11 27	11 30	11 34	11 39
	8	11 24	11 27	11 30	11 34	11 36	11 38	11 41	11 44	11 46	11 47	11 49	11 51	11 53
	9	12 10	12 10	12 9	12 9	12 9	12 8	12 8	12 8	12 8	12 8	12 8	12 8	12 7
	10	12 57	12 54	12 50	12 45	12 43	12 40	12 37	12 33	12 31	12 29	12 27	12 25	12 22
	11	13 47	13 40	13 32	13 24	13 19	13 14	13 8	13 0	12 56	12 53	12 48	12 44	12 39
	12	14 40	14 30	14 19	14 7	14 0	13 52	13 43	13 31	13 26	13 20	13 14	13 7	13 0
	13	15 37	15 24	15 11	14 55	14 46	14 36	14 24	14 10	14 3	13 55	13 47	13 38	13 27
	14	16 38	16 24	16 8	15 50	15 39	15 28	15 13	14 56	14 48	14 40	14 29	14 18	14 5
	15	17 41	17 26	17 10	16 51	16 40	16 27	16 12	15 54	15 45	15 36	15 25	15 13	14 58
	16	18 45	18 30	18 14	17 56	17 46	17 34	17 19	17 2	16 54	16 44	16 34	16 22	16 9
	17	19 46	19 34	19 20	19 4	18 55	18 44	18 32	18 17	18 10	18 2	17 53	17 43	17 32
	18	20 45	20 35	20 24	20 12	20 4	19 56	19 46	19 35	19 30	19 24	19 17	19 10	19 1
	19	21 39	21 32	21 25	21 17	21 12	21 7	21 0	20 52	20 49	20 45	20 41	20 36	20 30
	20	22 30	22 27	22 24	22 20	22 17	22 14	22 11	22 8	22 6	22 4	22 2	22 0	21 57
	21	23 19	23 19	23 19	23 19	23 19	23 20	23 20	23 20	23 20	23 20	23 20	23 21	23 21
	22	....	....	....	....	....	....	....	....	....	....	....	....	....
	23	0 6	0 9	0 13	0 17	0 20	0 22	0 26	0 30	0 32	0 34	0 36	0 38	0 41
	24	0 51	0 58	1 5	1 13	1 18	1 23	1 30	1 37	1 41	1 45	1 49	1 54	1 59
	25	1 37	1 47	1 57	2 8	2 15	2 23	2 32	2 43	2 48	2 53	3 0	3 6	3 14
	26	2 23	2 35	2 48	3 2	3 11	3 21	3 32	3 46	3 52	3 59	4 8	4 17	4 27
	27	3 10	3 24	3 39	3 55	4 5	4 16	4 30	4 46	4 54	5 2	5 12	5 23	5 35
	28	3 58	4 13	4 28	4 47	4 58	5 10	5 24	5 42	5 50	6 0	6 10	6 22	6 36
	29	4 46	5 1	5 17	5 36	5 47	6 0	6 15	6 33	6 41	6 51	7 2	7 14	7 29
	30	5 34	5 49	6 4	6 23	6 34	6 46	7 0	7 18	7 26	7 35	7 46	7 58	8 11
July	1	6 21	6 35	6 50	7 6	7 16	7 28	7 41	7 57	8 4	8 12	8 22	8 33	8 45
	2	7 8	7 20	7 33	7 47	7 56	8 6	8 17	8 30	8 37	8 44	8 52	9 0	9 10

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date.	Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
May	17	5 25	5 38	5 52	6 8	6 17	6 27	6 40	6 55	7 3	7 10	7 19	7 30	7 41
	18	6 26	6 41	6 57	7 15	7 26	7 38	7 52	8 10	8 18	8 27	8 37	8 49	9 3
	19	7 29	7 45	8 1	8 20	8 31	8 44	8 58	9 17	9 25	9 35	9 45	9 58	10 12
	20	8 32	8 46	9 2	9 20	9 30	9 42	9 56	10 13	10 21	10 30	10 40	10 51	11 4
	21	9 32	9 44	9 58	10 14	10 23	10 33	10 45	10 59	11 6	11 13	11 21	11 31	11 41
	22	10 28	10 38	10 49	11 1	11 8	11 16	11 26	11 37	11 42	11 47	11 53	12 0	12 8
	23	11 21	11 28	11 35	11 44	11 49	11 54	12 0	12 8	12 11	12 15	12 19	12 24	12 29
	24	12 11	12 14	12 18	12 23	12 25	12 28	12 31	12 35	12 37	12 39	12 41	12 43	12 45
	25	12 58	12 58	12 59	12 59	12 59	12 59	13 0	13 0	13 0	13 0	13 0	13 0	13 0
	26	13 44	13 41	13 38	13 34	13 32	13 30	13 27	13 24	13 22	13 21	13 19	13 17	13 15
	27	14 30	14 23	14 17	14 10	14 5	14 0	13 55	13 48	13 45	13 42	13 38	13 34	13 29
	28	15 15	15 6	14 56	14 46	14 40	14 32	14 24	14 14	14 10	14 4	13 59	13 53	13 46
	29	16 1	15 50	15 38	15 24	15 16	15 7	14 56	14 43	14 37	14 30	14 23	14 15	14 5
	30	16 48	16 35	16 21	16 4	15 55	15 44	15 31	15 16	15 8	15 0	14 52	14 41	14 30
	31	17 36	17 21	17 6	16 48	16 37	16 25	16 11	15 54	15 46	15 36	15 26	15 15	15 1
June	1	18 24	18 9	17 52	17 34	17 23	17 10	16 55	16 37	16 28	16 19	16 8	15 56	15 41
	2	19 12	18 57	18 41	18 22	18 12	17 59	17 44	17 27	17 18	17 8	16 58	16 46	16 32
	3	20 0	19 45	19 30	19 13	19 3	18 51	18 38	18 21	18 13	18 4	17 55	17 43	17 30
	4	20 46	20 34	20 21	20 5	19 56	19 46	19 34	19 20	19 13	19 6	18 57	18 47	18 36
	5	21 32	21 22	21 11	20 58	20 51	20 43	20 33	20 21	20 16	20 10	20 3	19 55	19 47
	6	22 17	22 9	22 1	21 53	21 47	21 40	21 33	21 25	21 21	21 16	21 12	21 6	21 0
	7	23 1	22 57	22 52	22 46	22 43	22 39	22 35	22 30	22 28	22 25	22 22	22 19	22 15
	8	23 46	23 45	23 43	23 42	23 41	23 40	23 38	23 37	23 36	23 35	23 34	23 34	23 32
	9	...	...	...	...	...	...	...	...	...	...	...	...	...
	10	0 32	0 34	0 36	0 39	0 40	0 42	0 44	0 46	0 47	0 48	0 49	0 50	0 52
	11	1 20	1 26	1 32	1 38	1 42	1 46	1 51	1 57	2 0	2 3	2 6	2 10	2 15
	12	2 12	2 21	2 30	2 40	2 47	2 54	3 2	3 12	3 16	3 21	3 27	3 33	3 40
	13	3 7	3 19	3 31	3 45	3 54	4 3	4 14	4 28	4 34	4 41	4 49	4 58	5 8
	14	4 6	4 20	4 35	4 52	5 2	5 13	5 27	5 48	5 51	6 0	6 10	6 20	6 33
	15	5 8	5 23	5 39	5 58	6 9	6 22	6 36	6 54	7 3	7 13	7 23	7 36	7 50
	16	6 12	6 27	6 43	7 2	7 13	7 25	7 40	7 57	8 6	8 15	8 26	8 38	8 52
	17	7 14	7 28	7 43	8 0	8 10	8 21	8 34	8 50	8 58	9 6	9 15	9 25	9 37
	18	8 15	8 26	8 38	8 52	9 0	9 9	9 20	9 33	9 39	9 45	9 52	10 0	10 10
	19	9 11	9 20	9 28	9 39	9 44	9 51	9 59	10 8	10 12	10 17	10 22	10 27	10 34
	20	10 4	10 9	10 14	10 20	10 24	10 28	10 32	10 38	10 40	10 43	10 46	10 49	10 53
	21	10 54	10 55	10 57	10 59	11 0	11 1	11 2	11 4	11 5	11 6	11 6	11 8	11 9
	22	11 41	11 40	11 38	11 35	11 34	11 32	11 31	11 29	11 28	11 27	11 26	11 24	11 23
	23	12 28	12 23	12 17	12 11	12 8	12 3	11 59	11 53	11 51	11 48	11 45	11 42	11 38
	24	13 14	13 5	12 57	12 47	12 42	12 35	12 28	12 19	12 15	12 10	12 6	12 0	11 54
	25	14 0	13 49	13 37	13 24	13 17	13 9	12 58	12 47	12 41	12 35	12 28	12 21	12 12
	26	14 46	14 33	14 20	14 4	13 55	13 44	13 33	13 18	13 11	13 4	12 55	12 46	12 35
	27	15 33	15 19	15 4	14 46	14 36	14 24	14 10	13 54	13 46	13 37	13 27	13 16	13 3
	28	16 21	16 6	15 50	15 31	15 20	15 8	14 53	14 35	14 27	14 17	14 7	13 54	13 40
	29	17 9	16 54	16 38	16 19	16 8	15 55	15 41	15 22	15 14	15 4	14 53	14 41	14 27
	30	17 57	17 42	17 27	17 9	16 58	16 47	16 32	16 15	16 7	15 58	15 48	15 36	15 22
July	1	18 44	18 31	18 17	18 1	17 51	17 41	17 28	17 13	17 6	16 58	16 48	16 38	16 26
	2	19 30	19 19	19 7	18 54	18 46	18 37	18 26	18 14	18 7	18 1	17 54	17 45	17 36

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July 1	6 21	6 35	6 50	7 6	7 16	7 28	7 41	7 57	8 4	8 12	8 22	8 33	8 45
2	7 8	7 20	7 33	7 47	7 56	8 6	8 17	8 30	8 37	8 44	8 52	9 0	9 10
3	7 53	8 3	8 14	8 26	8 32	8 40	8 49	9 0	9 5	9 10	9 16	9 23	9 31
4	8 38	8 45	8 53	9 2	9 6	9 12	9 18	9 26	9 30	9 34	9 38	9 42	9 48
5	9 23	9 27	9 31	9 36	9 39	9 42	9 46	9 50	9 52	9 54	9 57	10 0	10 3
6	10 7	10 8	10 9	10 10	10 11	10 12	10 13	10 14	10 14	10 15	10 15	10 16	10 17
7	10 53	10 51	10 48	10 45	10 44	10 42	10 40	10 38	10 36	10 35	10 34	10 32	10 30
8	11 40	11 35	11 29	11 22	11 18	11 14	11 9	11 3	11 0	10 57	10 54	10 50	10 46
9	12 30	12 22	12 12	12 2	11 56	11 49	11 41	11 31	11 27	11 22	11 17	11 11	11 4
10	13 24	13 12	13 0	12 46	12 38	12 28	12 18	12 5	11 59	11 52	11 45	11 37	11 27
11	14 21	14 7	13 52	13 36	13 26	13 15	13 2	12 46	12 38	12 30	12 21	12 11	11 59
12	15 22	15 6	14 50	14 32	14 21	14 9	13 54	13 36	13 28	13 19	13 8	12 56	12 43
13	16 24	16 9	15 52	15 34	15 23	15 10	14 56	14 38	14 29	14 20	14 9	13 57	13 43
14	17 27	17 13	16 57	16 40	16 30	16 19	16 5	15 49	15 41	15 32	15 23	15 12	14 59
15	18 27	18 16	18 3	17 49	17 41	17 31	17 20	17 6	17 0	16 53	16 45	16 36	16 26
16	19 25	19 16	19 7	18 57	18 50	18 44	18 36	18 26	18 21	18 16	18 11	18 5	17 58
17	20 19	20 14	20 9	20 2	19 59	19 55	19 50	19 44	19 42	19 39	19 36	19 32	19 28
18	21 10	21 9	21 7	21 6	21 4	21 3	21 2	21 0	21 0	20 59	20 58	20 57	20 56
19	21 59	22 1	22 3	22 6	22 7	22 9	22 11	22 13	22 14	22 15	22 17	22 18	22 20
20	22 47	22 52	22 58	23 4	23 8	23 12	23 18	23 23	23 26	23 29	23 33	23 37	23 41
21	23 33	23 42	23 51	....	....	....	....	....	....	....	....	....	....
22	....	....	....	0 1	0 7	0 14	0 22	0 31	0 35	0 40	0 46	0 52	0 59
23	0 20	0 31	0 43	0 56	1 4	1 13	1 23	1 36	1 42	1 48	1 56	2 4	2 14
24	1 7	1 20	1 34	1 50	1 59	2 10	2 22	2 38	2 45	2 53	3 2	3 12	3 24
25	1 54	2 9	2 24	2 42	2 52	3 4	3 18	3 35	3 44	3 53	4 3	4 14	4 28
26	2 42	2 57	3 13	3 32	3 43	3 56	4 10	4 28	4 37	4 46	4 57	5 9	5 24
27	3 30	3 45	4 1	4 20	4 31	4 43	4 58	5 15	5 24	5 33	5 44	5 56	6 10
28	4 18	4 32	4 47	5 5	5 15	5 26	5 40	5 57	6 4	6 13	6 23	6 34	6 46
29	5 5	5 18	5 31	5 47	5 56	6 6	6 18	6 32	6 39	6 46	6 55	7 4	7 15
30	5 51	6 2	6 13	6 26	6 33	6 42	6 52	7 3	7 9	7 15	7 22	7 29	7 38
31	6 37	6 45	6 53	7 3	7 9	7 15	7 22	7 31	7 35	7 40	7 45	7 50	7 56
Aug. 1	7 22	7 27	7 32	7 38	7 42	7 46	7 51	7 56	7 59	8 2	8 5	8 8	8 12
2	8 7	8 9	8 11	8 13	8 15	8 16	8 18	8 20	8 21	8 22	8 24	8 25	8 26
3	8 52	8 51	8 49	8 48	8 47	8 46	8 45	8 44	8 44	8 43	8 42	8 41	8 40
4	9 38	9 34	9 29	9 24	9 21	9 18	9 14	9 9	9 7	9 4	9 2	8 59	8 56
5	10 27	10 19	10 11	10 2	9 57	9 51	9 44	9 36	9 32	9 28	9 23	9 18	9 12
6	11 18	11 7	10 56	10 43	10 36	10 28	10 18	10 7	10 1	9 55	9 49	9 41	9 34
7	12 12	11 59	11 45	11 30	11 20	11 10	10 58	10 44	10 37	10 29	10 21	10 11	10 1
8	13 9	12 55	12 39	12 21	12 11	11 59	11 45	11 28	11 20	11 12	11 2	10 50	10 38
9	14 9	13 54	13 37	13 19	13 8	12 55	12 41	12 23	12 14	12 5	11 54	11 42	11 28
10	15 9	14 55	14 40	14 21	14 11	13 59	13 45	13 27	13 19	13 10	13 0	12 48	12 35
11	16 10	15 57	15 43	15 27	15 18	15 8	14 55	14 40	14 33	14 25	14 16	14 6	13 55
12	17 8	16 58	16 47	16 34	16 27	16 19	16 9	15 58	15 52	15 46	15 40	15 32	15 23
13	18 4	17 57	17 50	17 41	17 36	17 31	17 24	17 16	17 13	17 9	17 4	17 0	16 54
14	18 57	18 54	18 50	18 46	18 44	18 41	18 38	18 33	18 32	18 31	18 28	18 26	18 24
15	19 48	19 48	19 48	19 49	19 49	19 49	19 50	19 50	19 50	19 50	19 50	19 51	19 51
16	20 38	20 41	20 45	20 50	20 52	20 55	20 59	21 3	21 5	21 7	21 10	21 12	21 15

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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Date. \ Lat.		0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
		h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
July	1	18 44	18 31	18 17	18 1	17 51	17 41	17 28	17 13	17 6	16 58	16 48	16 38	16 26
	2	19 30	19 19	19 7	18 54	18 46	18 37	18 26	18 14	18 7	18 1	17 54	17 45	17 36
	3	20 15	20 7	19 58	19 47	19 41	19 34	19 26	19 16	19 12	19 7	19 2	18 55	18 48
	4	21 0	20 54	20 48	20 41	20 37	20 33	20 27	20 21	20 18	20 15	20 11	20 7	20 3
	5	21 44	21 42	21 39	21 36	21 34	21 32	21 30	21 27	21 25	21 24	21 22	21 21	21 19
	6	22 29	22 30	22 31	22 31	22 32	22 32	22 33	22 34	22 34	22 35	22 35	22 36	22 36
	7	23 15	23 20	23 24	23 29	23 31	23 35	23 38	23 43	23 45	23 47	23 50	23 52	23 55
	8	....	....	....	....	....	....	....	....	....	....	....	....	....
	9	0 4	0 11	0 19	0 28	0 33	0 39	0 46	0 54	0 58	1 2	1 6	1 12	1 17
	10	0 55	1 6	1 17	1 29	1 37	1 45	1 55	2 6	2 12	2 18	2 25	2 33	2 41
	11	1 51	2 4	2 17	2 33	2 42	2 53	3 5	3 20	3 27	3 35	3 44	3 54	4 6
	12	2 50	3 4	3 20	3 38	3 48	4 0	4 15	4 32	4 40	4 49	5 0	5 11	5 25
	13	3 51	4 6	4 23	4 42	4 53	5 5	5 20	5 38	5 47	5 56	6 7	6 19	6 34
	14	4 54	5 8	5 24	5 42	5 53	6 5	6 18	6 36	6 44	6 52	7 3	7 14	7 27
	15	5 56	6 8	6 22	6 38	6 47	6 57	7 9	7 24	7 31	7 38	7 46	7 56	8 6
	16	6 55	7 5	7 16	7 28	7 35	7 43	7 52	8 3	8 8	8 14	8 20	8 27	8 35
	17	7 51	7 58	8 5	8 13	8 18	8 23	8 29	8 37	8 40	8 44	8 48	8 52	8 57
	18	8 44	8 47	8 51	8 54	8 57	8 59	9 2	9 5	9 7	9 9	9 11	9 13	9 15
	19	9 34	9 34	9 33	9 33	9 33	9 32	9 32	9 32	9 32	9 32	9 31	9 31	9 31
	20	10 22	10 18	10 14	10 10	10 8	10 5	10 1	9 57	9 55	9 53	9 51	9 49	9 46
	21	11 9	11 2	10 55	10 47	10 42	10 37	10 30	10 23	10 20	10 16	10 12	10 7	10 2
	22	11 56	11 46	11 36	11 24	11 18	11 10	11 1	10 50	10 45	10 40	10 34	10 27	10 20
	23	12 43	12 31	12 18	12 3	11 55	11 45	11 34	11 21	11 14	11 7	11 0	10 51	10 41
	24	13 30	13 16	13 2	12 45	12 35	12 24	12 11	11 55	11 48	11 39	11 30	11 19	11 7
	25	14 18	14 3	13 47	13 29	13 18	13 6	12 52	12 34	12 26	12 17	12 6	11 54	11 41
	26	15 6	14 50	14 34	14 15	14 4	13 52	13 37	13 19	13 11	13 1	12 50	12 38	12 24
	27	15 53	15 39	15 23	15 5	14 54	14 42	14 27	14 10	14 2	13 52	13 42	13 30	13 16
	28	16 41	16 27	16 13	15 56	15 46	15 35	15 22	15 6	14 58	14 50	14 40	14 30	14 17
	29	17 28	17 16	17 3	16 49	16 40	16 31	16 19	16 6	15 59	15 52	15 44	15 35	15 25
	30	18 13	18 4	17 54	17 42	17 36	17 28	17 19	17 8	17 3	16 58	16 51	16 44	16 37
	31	18 59	18 52	18 45	18 37	18 32	18 27	18 20	18 13	18 9	18 6	18 1	17 56	17 51
Aug.	1	19 43	19 40	19 36	19 32	19 29	19 26	19 22	19 18	19 17	19 15	19 12	19 10	19 7
	2	20 28	20 28	20 28	20 27	20 27	20 26	20 26	20 25	20 25	20 25	20 25	20 24	20 24
	3	21 14	21 17	21 20	21 24	21 25	21 27	21 30	21 34	21 35	21 37	21 38	21 40	21 42
	4	22 1	22 7	22 14	22 21	22 26	22 31	22 36	22 43	22 46	22 50	22 54	22 58	23 3
	5	22 51	23 0	23 10	23 21	23 28	23 35	23 43	23 54	23 59	....	....	....	....
	6	23 43	23 55	....	....	....	....	....	....	....	0 4	0 10	0 17	0 24
	7	....	....	0 8	0 22	0 31	0 40	0 52	1 6	1 12	1 19	1 27	1 36	1 46
	8	0 39	0 53	1 8	1 25	1 35	1 46	2 0	2 16	2 24	2 32	2 42	2 52	3 5
	9	1 37	1 52	2 8	2 27	2 38	2 50	3 4	3 22	3 31	3 40	3 50	4 2	4 16
	10	2 38	2 53	3 9	3 27	3 38	3 50	4 4	4 22	4 30	4 40	4 50	5 2	5 15
	11	3 38	3 52	4 7	4 24	4 34	4 45	4 58	5 13	5 21	5 29	5 38	5 48	6 0
	12	4 38	4 49	5 2	5 16	5 24	5 33	5 44	5 56	6 2	6 9	6 16	6 24	6 34
	13	5 35	5 44	5 53	6 3	6 9	6 16	6 23	6 32	6 37	6 41	6 47	6 52	6 59
	14	6 30	6 35	6 40	6 46	6 50	6 54	6 58	7 4	7 6	7 9	7 12	7 15	7 19
	15	7 22	7 23	7 25	7 27	7 28	7 29	7 30	7 32	7 33	7 34	7 34	7 35	7 36
	16	8 12	8 10	8 8	8 5	8 4	8 2	8 1	7 59	7 57	7 56	7 55	7 54	7 52

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	20 38	20 41	20 45	20 50	20 52	20 55	20 59	21 3	21 5	21 7	21 10	21 12	21 15
17	21 26	21 33	21 40	21 49	21 54	21 59	22 6	22 14	22 17	22 21	22 26	22 31	22 36
18	22 14	22 23	22 34	22 46	22 53	23 1	23 10	23 21	23 26	23 32	23 39	23 46	23 54
19	23 1	23 13	23 26	23 41	23 50	....	....	....	....	....	....	....	....
20	23 49	....	....	....	....	0 0	0 11	0 25	0 32	0 39	0 48	0 57	1 7
21	....	0 3	0 18	0 35	0 44	0 56	1 9	1 25	1 33	1 42	1 51	2 2	2 15
22	0 37	0 52	1 8	1 26	1 36	1 49	2 3	2 20	2 29	2 38	2 49	3 0	3 14
23	1 25	1 40	1 56	2 14	2 25	2 38	2 52	3 10	3 18	3 28	3 38	3 50	4 4
24	2 13	2 27	2 43	3 0	3 11	3 23	3 37	3 53	4 1	4 10	4 20	4 32	4 45
25	3 0	3 13	3 27	3 44	3 53	4 4	4 16	4 32	4 38	4 46	4 55	5 5	5 16
26	3 47	3 58	4 10	4 24	4 32	4 41	4 52	5 4	5 10	5 17	5 24	5 32	5 42
27	4 33	4 42	4 51	5 2	5 8	5 16	5 24	5 34	5 38	5 43	5 49	5 55	6 2
28	5 18	5 25	5 31	5 39	5 43	5 48	5 54	6 0	6 3	6 7	6 10	6 15	6 19
29	6 4	6 7	6 10	6 14	6 16	6 19	6 22	6 27	6 27	6 28	6 30	6 32	6 34
30	6 50	6 50	6 50	6 50	6 50	6 50	6 49	6 49	6 49	6 49	6 49	6 49	6 49
31	7 36	7 33	7 30	7 26	7 23	7 21	7 18	7 14	7 13	7 11	7 9	7 7	7 4
Sept. 1	8 25	8 18	8 11	8 3	7 59	7 54	7 48	7 41	7 38	7 34	7 30	7 26	7 21
2	9 15	9 6	8 56	8 44	8 38	8 30	8 21	8 11	8 6	8 1	7 55	7 48	7 41
3	10 8	9 56	9 43	9 29	9 20	9 10	8 59	8 46	8 40	8 33	8 25	8 16	8 6
4	11 4	10 50	10 35	10 18	10 8	9 57	9 43	9 28	9 20	9 12	9 2	8 52	8 40
5	12 1	11 46	11 30	11 12	11 1	10 49	10 35	10 18	10 9	10 0	9 50	9 38	9 25
6	13 0	12 45	12 29	12 11	12 1	11 48	11 34	11 17	11 9	10 59	10 49	10 37	10 24
7	13 58	13 45	13 30	13 14	13 4	12 53	12 40	12 24	12 17	12 8	11 59	11 48	11 36
8	14 56	14 44	14 32	14 18	14 10	14 1	13 50	13 37	13 31	13 24	13 17	13 8	12 59
9	15 51	15 43	15 34	15 24	15 18	15 11	15 3	14 53	14 49	14 44	14 39	14 33	14 26
10	16 45	16 40	16 34	16 28	16 24	16 20	16 16	16 10	16 7	16 5	16 1	15 58	15 54
11	17 36	17 35	17 33	17 31	17 30	17 29	17 28	17 26	17 25	17 24	17 23	17 22	17 21
12	18 26	18 28	18 30	18 33	18 34	18 36	18 38	18 40	18 41	18 42	18 44	18 45	18 47
13	19 15	19 21	19 26	19 33	19 37	19 41	19 46	19 52	19 55	19 58	20 2	20 6	20 10
14	20 4	20 12	20 22	20 32	20 38	20 44	20 53	21 2	21 7	21 12	21 17	21 23	21 30
15	20 53	21 4	21 15	21 29	21 37	21 46	21 56	22 9	22 15	22 22	22 29	22 37	22 46
16	21 41	21 54	22 8	22 24	22 33	22 44	22 56	23 12	23 19	23 27	23 36	23 46	23 58
17	22 30	22 44	22 59	23 17	23 27	23 39	23 53	....	....	....	....	....	....
18	23 18	23 33	23 49	....	....	....	....	0 10	0 18	0 26	0 36	0 48	1 1
19	....	....	....	0 7	0 18	0 30	0 44	1 2	1 10	1 19	1 30	1 42	1 56
20	0 6	0 21	0 36	0 54	1 5	1 16	1 31	1 48	1 56	2 5	2 15	2 26	2 40
21	0 53	1 7	1 22	1 38	1 48	1 59	2 12	2 28	2 35	2 44	2 53	3 3	3 15
22	1 40	1 52	2 5	2 20	2 28	2 38	2 49	3 3	3 9	3 16	3 24	3 33	3 43
23	2 26	2 36	2 46	2 59	3 6	3 14	3 23	3 34	3 39	3 44	3 50	3 57	4 5
24	3 12	3 19	3 27	3 36	3 41	3 47	3 53	4 1	4 5	4 9	4 13	4 18	4 24
25	3 57	4 2	4 6	4 12	4 15	4 18	4 22	4 27	4 29	4 32	4 34	4 37	4 40
26	4 44	4 45	4 46	4 48	4 48	4 49	4 51	4 52	4 52	4 53	4 54	4 55	4 56
27	5 31	5 29	5 26	5 24	5 23	5 21	5 19	5 17	5 16	5 15	5 14	5 12	5 11
28	6 19	6 14	6 8	6 2	5 58	5 54	5 49	5 44	5 41	5 38	5 35	5 32	5 28
29	7 10	7 2	6 53	6 42	6 37	6 30	6 22	6 13	6 9	6 4	5 59	5 54	5 47
30	8 3	7 52	7 40	7 27	7 19	7 10	7 0	6 47	6 41	6 35	6 28	6 20	6 11
Oct. 1	8 59	8 46	8 31	8 15	8 6	7 55	7 43	7 28	7 20	7 12	7 4	6 54	6 42

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Aug. 16	8 12	8 10	8 8	8 5	8 4	8 2	8 1	7 59	7 57	7 56	7 55	7 54	7 52
17	9 1	8 55	8 50	8 43	8 40	8 35	8 31	8 25	8 22	8 19	8 16	8 13	8 9
18	9 49	9 40	9 32	9 22	9 16	9 9	9 2	8 52	8 48	8 43	8 38	8 33	8 26
19	10 37	10 26	10 14	10 1	9 53	9 44	9 34	9 22	9 16	9 10	9 3	8 55	8 47
20	11 24	11 12	10 58	10 42	10 33	10 22	10 10	9 55	9 48	9 41	9 32	9 22	9 11
21	12 12	11 58	11 43	11 25	11 15	11 3	10 49	10 33	10 25	10 16	10 6	9 55	9 42
22	13 0	12 45	12 29	12 11	12 0	11 48	11 33	11 16	11 7	10 58	10 48	10 36	10 22
23	13 48	13 33	13 18	12 59	12 48	12 36	12 22	12 4	11 56	11 46	11 36	11 24	11 10
24	14 36	14 22	14 7	13 50	13 40	13 28	13 14	12 58	12 50	12 41	12 32	12 20	12 8
25	15 23	15 10	14 57	14 42	14 33	14 23	14 11	13 56	13 50	13 42	13 33	13 24	13 13
26	16 9	15 59	15 48	15 35	15 28	15 20	15 10	14 58	14 52	14 46	14 39	14 32	14 23
27	16 55	16 47	16 39	16 30	16 24	16 18	16 11	16 2	15 58	15 53	15 48	15 43	15 36
28	17 40	17 36	17 30	17 25	17 21	17 18	17 13	17 8	17 5	17 3	17 0	16 56	16 52
29	18 26	18 24	18 23	18 21	18 20	18 18	18 17	18 15	18 14	18 13	18 12	18 11	18 10
30	19 12	19 14	19 16	19 18	19 19	19 20	19 22	19 24	19 24	19 25	19 26	19 27	19 29
31	20 0	20 4	20 10	20 16	20 19	20 23	20 28	20 34	20 36	20 39	20 42	20 46	20 49
Sept. 1	20 49	20 57	21 6	21 15	21 21	21 28	21 35	21 44	21 49	21 54	21 58	22 4	22 11
2	21 40	21 51	22 3	22 16	22 24	22 33	22 43	22 56	23 2	23 8	23 16	23 24	23 33
3	22 34	22 48	23 2	23 18	23 27	23 38	23 50	....	....	....	....	....	....
4	23 31	23 46	....	....	....	....	....	0 6	0 13	0 21	0 30	0 40	0 52
5	....	....	0 1	0 19	0 29	0 41	0 55	1 13	1 21	1 30	1 40	1 52	2 5
6	0 29	0 44	1 0	1 18	1 29	1 41	1 56	2 13	2 22	2 31	2 41	2 53	3 7
7	1 28	1 42	1 57	2 15	2 25	2 36	2 50	3 6	3 14	3 22	3 32	3 43	3 55
8	2 26	2 38	2 52	3 7	3 15	3 26	3 37	3 51	3 58	4 5	4 13	4 22	4 32
9	3 22	3 32	3 43	3 55	4 2	4 9	4 18	4 29	4 34	4 40	4 46	4 52	5 0
10	4 17	4 24	4 31	4 39	4 43	4 48	4 54	5 2	5 5	5 9	5 13	5 17	5 22
11	5 9	5 13	5 16	5 20	5 22	5 25	5 28	5 31	5 32	5 34	5 36	5 38	5 40
12	6 0	6 0	6 0	5 59	5 59	5 59	5 58	5 58	5 58	5 58	5 58	5 57	5 57
13	6 50	6 46	6 42	6 38	6 35	6 32	6 29	6 25	6 23	6 21	6 19	6 16	6 14
14	7 39	7 32	7 25	7 16	7 12	7 6	7 0	6 52	6 49	6 45	6 41	6 36	6 31
15	8 28	8 18	8 8	7 56	7 49	7 41	7 32	7 22	7 16	7 11	7 5	6 58	6 51
16	9 16	9 4	8 51	8 37	8 28	8 19	8 7	7 54	7 48	7 40	7 33	7 24	7 14
17	10 5	9 51	9 36	9 20	9 10	8 59	8 46	8 30	8 23	8 15	8 5	7 55	7 43
18	10 53	10 39	10 23	10 5	9 54	9 42	9 28	9 11	9 3	8 54	8 44	8 32	8 19
19	11 41	11 27	11 11	10 52	10 42	10 30	10 15	9 58	9 49	9 40	9 30	9 18	9 4
20	12 29	12 15	12 0	11 42	11 32	11 20	11 6	10 49	10 41	10 32	10 22	10 11	9 58
21	13 16	13 3	12 49	12 33	12 24	12 13	12 1	11 46	11 38	11 30	11 22	11 11	11 0
22	14 2	13 51	13 40	13 26	13 18	13 9	12 58	12 45	12 39	12 33	12 25	12 17	12 7
23	14 48	14 40	14 30	14 20	14 13	14 6	13 58	13 48	13 43	13 38	13 32	13 26	13 19
24	15 34	15 28	15 22	15 14	15 10	15 5	15 0	14 53	14 50	14 46	14 43	14 39	14 34
25	16 20	16 17	16 14	16 10	16 8	16 6	16 3	16 0	15 58	15 57	15 55	15 53	15 51
26	17 6	17 6	17 7	17 7	17 8	17 8	17 8	17 9	17 9	17 9	17 9	17 9	17 10
27	17 54	17 57	18 1	18 6	18 8	18 11	18 15	18 19	18 21	18 23	18 25	18 28	18 31
28	18 43	18 50	18 58	19 6	19 11	19 17	19 23	19 31	19 35	19 39	19 43	19 48	19 54
29	19 35	19 45	19 56	20 8	20 15	20 23	20 32	20 44	20 49	20 55	21 2	21 9	21 17
30	20 30	20 42	20 55	21 11	21 20	21 30	21 42	21 56	22 3	22 10	22 19	22 28	22 39
Oct. 1	21 26	21 40	21 56	22 13	22 23	22 34	22 48	23 5	23 12	23 21	23 31	23 42	23 55

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

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Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	8 59	8 46	8 31	8 15	8 6	7 55	7 43	7 28	7 20	7 12	7 4	6 54	6 42
2	9 56	9 42	9 26	9 8	8 58	8 46	8 32	8 15	8 7	7 59	7 48	7 37	7 24
3	10 55	10 40	10 24	10 6	9 56	9 43	9 29	9 12	9 4	8 54	8 44	8 32	8 19
4	11 53	11 39	11 24	11 7	10 57	10 46	10 32	10 16	10 8	10 0	9 50	9 39	9 27
5	12 50	12 38	12 25	12 10	12 1	11 52	11 40	11 26	11 20	11 13	11 4	10 55	10 45
6	13 44	13 35	13 25	13 13	13 7	12 59	12 50	12 40	12 35	12 29	12 23	12 16	12 8
7	14 37	14 30	14 24	14 16	14 12	14 7	14 1	13 54	13 51	13 47	13 43	13 39	13 34
8	15 28	15 25	15 22	15 18	15 16	15 14	15 11	15 9	15 7	15 5	15 3	15 1	14 59
9	16 17	16 18	16 18	16 19	16 19	16 20	16 20	16 21	16 21	16 22	16 22	16 22	16 23
10	17 6	17 10	17 14	17 19	17 22	17 25	17 29	17 33	17 35	17 37	17 40	17 43	17 46
11	17 54	18 2	18 9	18 18	18 23	18 29	18 35	18 43	18 47	18 51	18 56	19 1	19 7
12	18 43	18 53	19 3	19 16	19 23	19 31	19 40	19 51	19 57	20 2	20 9	20 16	20 25
13	19 32	19 44	19 57	20 12	20 21	20 31	20 42	20 56	21 3	21 10	21 19	21 28	21 39
14	20 21	20 35	20 49	21 6	21 16	21 28	21 41	21 57	22 5	22 13	22 23	22 34	22 46
15	21 10	21 24	21 40	21 58	22 9	22 21	22 35	22 52	23 0	23 9	23 20	23 32	23 45
16	21 58	22 13	22 29	22 47	22 57	23 10	23 24	23 41	23 49	23 58	....	....	....
17	22 46	23 0	23 15	23 32	23 42	23 54	....	....	....	....	0 9	0 20	0 34
18	23 33	23 46	23 59	....	....	....	0 7	0 24	0 31	0 39	0 49	1 0	1 13
19	....	....	....	0 15	0 24	0 34	0 46	1 0	1 7	1 14	1 23	1 32	1 43
20	0 19	0 30	0 41	0 54	1 2	1 10	1 20	1 32	1 38	1 44	1 51	1 59	2 8
21	1 4	1 12	1 21	1 31	1 37	1 44	1 52	2 1	2 5	2 10	2 15	2 21	2 27
22	1 49	1 55	2 1	2 7	2 11	2 16	2 21	2 27	2 30	2 33	2 36	2 40	2 44
23	2 34	2 37	2 40	2 43	2 45	2 47	2 49	2 52	2 53	2 55	2 56	2 58	3 0
24	3 21	3 20	3 20	3 19	3 18	3 18	3 18	3 17	3 17	3 16	3 16	3 16	3 16
25	4 9	4 5	4 1	3 56	3 54	3 51	3 47	3 43	3 41	3 39	3 37	3 34	3 32
26	4 59	4 52	4 44	4 36	4 31	4 26	4 19	4 12	4 8	4 4	4 0	3 56	3 50
27	5 52	5 42	5 32	5 19	5 12	5 4	4 55	4 44	4 39	4 33	4 27	4 20	4 12
28	6 49	6 36	6 23	6 8	5 59	5 49	5 37	5 23	5 16	5 9	5 1	4 52	4 41
29	7 47	7 33	7 18	7 0	6 50	6 39	6 26	6 9	6 1	5 53	5 43	5 32	5 20
30	8 47	8 32	8 17	7 58	7 48	7 36	7 22	7 4	6 56	6 47	6 37	6 25	6 12
31	9 47	9 33	9 18	9 0	8 50	8 38	8 25	8 8	8 0	7 51	7 41	7 30	7 17
Nov. 1	10 45	10 32	10 19	10 4	9 55	9 44	9 32	9 18	9 10	9 3	8 54	8 45	8 34
2	11 41	11 30	11 20	11 7	11 0	10 52	10 42	10 30	10 25	10 19	10 12	10 5	9 56
3	12 34	12 26	12 19	12 10	12 5	11 59	11 52	11 44	11 40	11 36	11 32	11 27	11 21
4	13 24	13 20	13 16	13 11	13 8	13 5	13 2	12 57	12 55	12 53	12 51	12 48	12 45
5	14 13	14 12	14 12	14 11	14 11	14 10	14 10	14 9	14 9	14 9	14 8	14 8	14 8
6	15 1	15 4	15 7	15 10	15 12	15 14	15 17	15 20	15 22	15 23	15 25	15 27	15 29
7	15 49	15 55	16 1	16 8	16 12	16 17	16 23	16 30	16 33	16 36	16 40	16 44	16 49
8	16 36	16 45	16 55	17 6	17 12	17 19	17 27	17 37	17 42	17 47	17 53	18 0	18 7
9	17 25	17 36	17 48	18 2	18 10	18 19	18 30	18 43	18 49	18 56	19 4	19 12	19 22
10	18 13	18 26	18 41	18 57	19 6	19 17	19 30	19 45	19 52	20 1	20 10	20 20	20 32
11	19 2	19 17	19 32	19 50	20 0	20 12	20 28	20 43	20 51	21 0	21 10	21 22	21 35
12	19 51	20 6	20 22	20 40	20 51	21 3	21 17	21 34	21 43	21 52	22 2	22 14	22 28
13	20 39	20 54	21 9	21 27	21 37	21 49	22 3	22 20	22 28	22 36	22 46	22 58	23 11
14	21 27	21 40	21 54	22 10	22 20	22 31	22 43	22 59	23 6	23 14	23 23	23 33	23 44
15	22 13	22 24	22 37	22 51	22 59	23 8	23 19	23 32	23 38	23 45	23 53	....	....
16	22 58	23 7	23 17	23 28	23 35	23 43	23 51	....	....	....	....	0 1	0 11
17	23 42	23 49	23 56	....	....	....	....	0 2	0 7	0 12	0 18	0 24	0 32

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date.	Lat. 0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Oct. 1	21 26	21 40	21 56	22 13	22 23	22 34	22 48	23 5	23 12	23 21	23 31	23 42	23 55
2	22 24	22 39	22 55	23 13	23 24	23 36	23 50	....	....	....	....	....	....
3	23 23	23 37	23 53	....	....	....	....	0 8	0 16	0 25	0 35	0 47	1 1
4	....	....	....	0 10	0 20	0 32	0 46	1 3	1 10	1 19	1 29	1 40	1 53
5	0 20	0 38	0 47	1 3	1 12	1 22	1 35	1 49	1 56	2 4	2 12	2 22	2 33
6	1 16	1 27	1 38	1 51	1 58	2 7	2 17	2 28	2 34	2 40	2 47	2 54	3 2
7	2 10	2 18	2 26	2 35	2 41	2 47	2 54	3 2	3 6	3 10	3 15	3 20	3 26
8	3 1	3 6	3 11	3 16	3 19	3 23	3 27	3 32	3 34	3 36	3 39	3 42	3 45
9	3 51	3 53	3 54	3 55	3 56	3 57	3 58	3 59	4 0	4 0	4 1	4 1	4 2
10	4 41	4 38	4 36	4 33	4 32	4 30	4 28	4 26	4 24	4 23	4 22	4 20	4 19
11	5 29	5 24	5 18	5 11	5 8	5 3	4 58	4 52	4 50	4 46	4 43	4 39	4 35
12	6 18	6 9	6 0	5 50	5 44	5 38	5 30	5 21	5 16	5 12	5 6	5 0	4 54
13	7 7	6 56	6 44	6 31	6 23	6 14	6 4	5 52	5 46	5 39	5 32	5 25	5 16
14	7 56	7 43	7 29	7 13	7 4	6 53	6 41	6 26	6 20	6 12	6 3	5 54	5 42
15	8 45	8 31	8 16	7 58	7 48	7 36	7 23	7 6	6 58	6 49	6 40	6 28	6 16
16	9 34	9 19	9 3	8 45	8 34	8 22	8 8	7 50	7 42	7 33	7 23	7 11	6 58
17	10 22	10 7	9 52	9 34	9 23	9 12	8 57	8 40	8 32	8 23	8 13	8 1	7 48
18	11 9	10 55	10 41	10 24	10 15	10 4	9 51	9 35	9 27	9 19	9 10	8 59	8 47
19	11 55	11 43	11 31	11 16	11 8	10 58	10 47	10 33	10 26	10 19	10 11	10 2	9 52
20	12 41	12 31	12 21	12 9	12 2	11 54	11 45	11 34	11 28	11 22	11 16	11 9	11 1
21	13 26	13 19	13 11	13 2	12 57	12 51	12 45	12 36	12 33	12 29	12 24	12 19	12 13
22	14 11	14 7	14 2	13 57	13 54	13 50	13 46	13 42	13 39	13 37	13 34	13 32	13 28
23	14 56	14 55	14 54	14 53	14 52	14 51	14 50	14 49	14 48	14 48	14 47	14 46	14 45
24	15 43	15 45	15 48	15 50	15 52	15 54	15 56	15 58	15 59	16 1	16 2	16 3	16 5
25	16 32	16 38	16 44	16 50	16 54	16 59	17 4	17 10	17 13	17 16	17 20	17 23	17 28
26	17 24	17 33	17 42	17 53	17 59	18 6	18 14	18 24	18 28	18 33	18 39	18 45	18 52
27	18 19	18 30	18 43	18 57	19 5	19 14	19 25	19 38	19 44	19 51	19 59	20 8	20 17
28	19 16	19 30	19 44	20 1	20 11	20 22	20 35	20 51	20 58	21 6	21 16	21 26	21 38
29	20 16	20 30	20 46	21 4	21 15	21 27	21 41	21 58	22 6	22 15	22 26	22 37	22 51
30	21 16	21 31	21 46	22 4	22 15	22 26	22 41	22 58	23 6	23 15	23 25	23 36	23 49
31	22 15	22 28	22 43	22 59	23 9	23 20	23 32	23 48	23 55	....	....	....	....
Nov. 1	23 12	23 24	23 36	23 50	23 58	....	....	....	....	0 3	0 12	0 22	0 34
2	....	....	....	....	....	0 7	0 17	0 30	0 36	0 42	0 49	0 58	1 7
3	0 6	0 15	0 24	0 35	0 41	0 48	0 56	1 5	1 9	1 14	1 19	1 25	1 32
4	0 58	1 4	1 10	1 16	1 20	1 24	1 29	1 35	1 38	1 41	1 44	1 48	1 52
5	1 48	1 50	1 52	1 55	1 57	1 58	2 0	2 3	2 4	2 5	2 6	2 8	2 9
6	2 36	2 35	2 34	2 33	2 32	2 31	2 30	2 29	2 28	2 28	2 27	2 26	2 25
7	3 24	3 20	3 15	3 10	3 7	3 3	2 59	2 55	2 52	2 50	2 48	2 45	2 41
8	4 12	4 4	3 56	3 47	3 42	3 36	3 30	3 22	3 18	3 14	3 10	3 4	2 59
9	5 0	4 50	4 39	4 27	4 20	4 12	4 2	3 51	3 46	3 40	3 34	3 27	3 19
10	5 48	5 36	5 23	5 8	4 59	4 50	4 38	4 24	4 18	4 10	4 2	3 53	3 43
11	6 37	6 23	6 9	5 52	5 42	5 31	5 18	5 2	4 54	4 46	4 36	4 26	4 14
12	7 26	7 12	6 56	6 38	6 28	6 16	6 1	5 44	5 36	5 27	5 17	5 5	4 52
13	8 15	8 0	7 44	7 26	7 16	7 4	6 50	6 32	6 24	6 15	6 4	5 53	5 39
14	9 3	8 49	8 34	8 16	8 6	7 55	7 41	7 25	7 17	7 8	6 58	6 48	6 35
15	9 49	9 37	9 23	9 8	8 59	8 48	8 36	8 22	8 14	8 7	7 58	7 49	7 37
16	10 35	10 24	10 13	10 0	9 52	9 43	9 33	9 21	9 15	9 9	9 2	8 54	8 44
17	11 19	11 11	11 2	10 52	10 46	10 39	10 32	10 22	10 18	10 13	10 7	10 2	9 55

LOCAL ASTRONOMICAL MEAN TIME OF MOONRISE (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	22 58	23 7	23 17	23 28	23 35	23 43	23 51	....	....	....	....	0 1	0 11
17	23 42	23 49	23 56	....	....	....	....	0 2	0 7	0 12	0 18	0 24	0 32
18	....	....	....	0 5	0 9	0 15	0 21	0 28	0 32	0 36	0 40	0 45	0 50
19	0 26	0 30	0 34	0 39	0 42	0 45	0 49	0 53	0 55	0 57	1 0	1 3	1 6
20	1 11	1 12	1 13	1 14	1 15	1 16	1 16	1 18	1 18	1 18	1 19	1 20	1 20
21	1 57	1 55	1 52	1 50	1 48	1 46	1 44	1 42	1 41	1 40	1 39	1 37	1 36
22	2 45	2 40	2 34	2 27	2 24	2 19	2 14	2 9	2 6	2 3	2 0	1 56	1 52
23	3 37	3 28	3 19	3 8	3 3	2 56	2 48	2 39	2 35	2 30	2 25	2 19	2 12
24	4 32	4 20	4 8	3 54	3 46	3 37	3 27	3 14	3 8	3 2	2 55	2 47	2 38
25	5 30	5 16	5 2	4 46	4 36	4 25	4 12	3 57	3 50	3 42	3 33	3 23	3 11
26	6 31	6 16	6 1	5 43	5 32	5 20	5 6	4 49	4 41	4 32	4 22	4 10	3 57
27	7 33	7 19	7 3	6 45	6 34	6 22	6 8	5 51	5 43	5 34	5 24	5 12	4 58
28	8 35	8 21	8 7	7 50	7 41	7 30	7 17	7 1	6 54	6 46	6 36	6 26	6 14
29	9 34	9 22	9 10	8 56	8 48	8 39	8 29	8 16	8 10	8 3	7 56	7 47	7 38
30	10 29	10 21	10 12	10 2	9 56	9 49	9 41	9 32	9 27	9 23	9 17	9 11	9 4
Dec. 1	11 22	11 16	11 11	11 5	11 1	10 57	10 53	10 47	10 44	10 42	10 38	10 35	10 31
2	12 11	12 10	12 8	12 6	12 5	12 4	12 2	12 0	11 59	11 58	11 58	11 56	11 55
3	13 0	13 1	13 3	13 5	13 6	13 8	13 9	13 11	13 12	13 13	13 14	13 15	13 17
4	13 47	13 52	13 57	14 3	14 6	14 10	14 15	14 20	14 23	14 26	14 29	14 33	14 36
5	14 34	14 42	14 50	15 0	15 5	15 12	15 19	15 28	15 32	15 37	15 42	15 48	15 54
6	15 21	15 32	15 43	15 55	16 3	16 12	16 22	16 34	16 39	16 46	16 52	17 0	17
7	16 9	16 22	16 35	16 50	16 59	17 10	17 22	17 37	17 43	17 51	18 0	18 10	18 2
8	16 57	17 11	17 26	17 44	17 54	18 5	18 19	18 35	18 43	18 52	19 2	19 13	19 2
9	17 46	18 1	18 16	18 35	18 45	18 57	19 12	19 29	19 37	19 46	19 57	20 9	20 2
10	18 34	18 49	19 5	19 23	19 33	19 45	20 0	20 17	20 25	20 34	20 44	20 56	21
11	19 22	19 35	19 51	20 8	20 18	20 29	20 42	20 58	21 6	21 14	21 24	21 34	21
12	20 9	20 21	20 34	20 49	20 58	21 8	21 20	21 34	21 40	21 48	21 56	22 5	22
13	20 54	21 4	21 15	21 28	21 35	21 44	21 53	22 5	22 10	22 16	22 22	22 30	22
14	21 38	21 46	21 55	22 4	22 10	22 16	22 23	22 32	22 36	22 41	22 46	22 51	22
15	22 22	22 27	22 33	22 39	22 43	22 47	22 52	22 57	23 0	23 3	23 6	23 9	23
16	23 5	23 8	23 10	23 13	23 14	23 16	23 18	23 21	23 22	23 23	23 25	23 26	23
17	23 49	23 49	23 48	23 47	23 46	23 46	23 45	23 45	23 44	23 44	23 44	23 43	23 43
18	....	....	....	....	....	....	....	....	....	....	....	....	23 58
19	0 35	0 31	0 27	0 22	0 20	0 17	0 13	0 9	0 7	0 5	0 3	0 1	....
20	1 23	1 16	1 9	1 0	0 56	0 50	0 44	0 36	0 33	0 29	0 25	0 20	0 15
21	2 15	2 5	1 54	1 42	1 35	1 28	1 19	1 8	1 3	0 57	0 51	0 44	0 37
22	3 10	2 58	2 44	2 29	2 21	2 11	1 59	1 45	1 39	1 32	1 24	1 15	1
23	4 9	3 55	3 40	3 22	3 12	3 1	2 48	2 32	2 24	2 15	2 6	1 55	1 4
24	5 11	4 56	4 41	4 22	4 12	4 0	3 45	3 28	3 20	3 11	3 0	2 49	2 3
25	6 15	6 0	5 45	5 27	5 17	5 5	4 52	4 35	4 27	4 18	4 8	3 57	3 4
26	7 17	7 4	6 51	6 35	6 26	6 16	6 4	5 50	5 43	5 35	5 27	5 17	5 6
27	8 16	8 6	7 56	7 44	7 37	7 29	7 20	7 8	7 3	6 57	6 51	6 44	6 36
28	9 12	9 6	8 59	8 51	8 46	8 41	8 35	8 27	8 24	8 20	8 16	8 12	8 6
29	10 6	10 2	9 59	9 55	9 53	9 51	9 48	9 44	9 43	9 41	9 39	9 37	9 35
30	10 56	10 56	10 57	10 57	10 57	10 58	10 58	10 59	10 59	10 59	11 0	11 0	11 0
31	11 44	11 48	11 52	11 57	11 59	12 2	12 6	12 10	12 12	12 14	12 17	12 19	12 22
32	12 32	12 39	12 46	12 55	12 59	13 5	13 12	13 19	13 23	13 27	13 31	13 36	13 42

LOCAL ASTRONOMICAL MEAN TIME OF MOONSET (MOON'S UPPER LIMB), MERIDIAN OF GREENWICH, 1920.

To obtain civil time, write P. M. after the astronomical time if it is less than twelve hours; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To obtain standard time, see directions on page 116.

For other longitudes and for southern latitudes see page 150.

Date. \ Lat.	0°	+10°	+20°	+30°	+35°	+40°	+45°	+50°	+52°	+54°	+56°	+58°	+60°
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
Nov. 16	10 35	10 24	10 13	10 0	9 52	9 43	9 33	9 21	9 15	9 9	9 2	8 54	8 44
17	11 19	11 11	11 2	10 52	10 46	10 39	10 32	10 22	10 18	10 13	10 7	10 2	9 55
18	12 3	11 58	11 52	11 45	11 41	11 37	11 31	11 25	11 22	11 19	11 16	11 11	11 7
19	12 48	12 45	12 42	12 39	12 37	12 35	12 33	12 30	12 29	12 27	12 26	12 24	12 22
20	13 33	13 33	13 34	13 35	13 35	13 36	13 36	13 37	13 37	13 37	13 38	13 38	13 39
21	14 20	14 24	14 28	14 32	14 35	14 38	14 42	14 46	14 48	14 50	14 52	14 55	14 58
22	15 9	15 16	15 24	15 33	15 38	15 43	15 50	15 58	16 2	16 6	16 10	16 15	16 21
23	16 2	16 12	16 23	16 36	16 43	16 51	17 0	17 12	17 17	17 23	17 30	17 37	17 46
24	16 59	17 12	17 25	17 40	17 49	18 0	18 12	18 26	18 33	18 41	18 50	18 59	19 10
25	17 59	18 13	18 28	18 46	18 56	19 8	19 22	19 39	19 46	19 55	20 5	20 16	20 29
26	19 1	19 16	19 32	19 50	20 0	20 12	20 27	20 44	20 52	21 1	21 12	21 24	21 37
27	20 3	20 17	20 32	20 50	20 59	21 11	21 24	21 41	21 48	21 57	22 6	22 17	22 30
28	21 3	21 16	21 29	21 44	21 52	22 2	22 14	22 28	22 34	22 41	22 49	22 58	23 8
29	22 0	22 10	22 20	22 32	22 39	22 47	22 56	23 6	23 11	23 17	23 22	23 29	23 37
30	22 54	23 1	23 8	23 16	23 21	23 26	23 32	23 39	23 43	23 46	23 50	23 54	23 59
Dec. 1	23 46	23 49	23 52	23 56	23 59	....	....	....	....	....	....	....	....
2	....	....	....	....	....	0 1	0 4	0 8	0 10	0 11	0 13	0 15	0 18
3	0 35	0 35	0 35	0 34	0 34	0 34	0 34	0 34	0 34	0 34	0 34	0 34	0 34
4	1 22	1 19	1 15	1 11	1 9	1 6	1 3	1 0	0 58	0 56	0 54	0 52	0 50
5	2 9	2 3	1 56	1 48	1 44	1 38	1 33	1 26	1 22	1 19	1 16	1 11	1 6
6	2 56	2 47	2 38	2 26	2 20	2 13	2 4	1 54	1 50	1 44	1 38	1 32	1 25
7	3 44	3 33	3 20	3 6	2 58	2 49	2 38	2 25	2 19	2 12	2 5	1 56	1 47
8	4 32	4 19	4 5	3 48	3 39	3 28	3 16	3 0	2 53	2 45	2 36	2 26	2 14
9	5 21	5 7	4 51	4 33	4 23	4 11	3 57	3 41	3 32	3 24	3 14	3 2	2 49
10	6 10	5 55	5 39	5 21	5 10	4 58	4 44	4 26	4 18	4 9	3 58	3 46	3 33
11	6 58	6 43	6 28	6 10	6 0	5 48	5 34	5 17	5 9	5 0	4 50	4 38	4 25
12	7 45	7 32	7 17	7 1	6 52	6 41	6 28	6 12	6 5	5 57	5 48	5 37	5 25
13	8 31	8 19	8 7	7 53	7 45	7 35	7 24	7 11	7 4	6 58	6 50	6 41	6 31
14	9 16	9 6	8 56	8 45	8 38	8 31	8 22	8 11	8 6	8 1	7 55	7 48	7 40
15	9 59	9 53	9 46	9 37	9 32	9 27	9 21	9 13	9 10	9 6	9 2	8 57	8 51
16	10 43	10 39	10 35	10 30	10 27	10 24	10 21	10 16	10 14	10 12	10 10	10 7	10 4
17	11 26	11 26	11 25	11 24	11 23	11 22	11 22	11 20	11 20	11 20	11 19	11 18	11 18
18	12 11	12 13	12 16	12 19	12 20	12 22	12 24	12 27	12 28	12 29	12 30	12 32	12 34
19	12 58	13 3	13 9	13 16	13 20	13 24	13 29	13 35	13 38	13 41	13 44	13 48	13 52
20	13 47	13 56	14 5	14 16	14 22	14 28	14 36	14 46	14 51	14 55	15 1	15 7	15 14
21	14 41	14 52	15 4	15 18	15 26	15 35	15 46	15 59	16 5	16 11	16 19	16 27	16 37
22	15 38	15 51	16 6	16 22	16 32	16 43	16 56	17 11	17 19	17 27	17 36	17 47	17 59
23	16 38	16 53	17 9	17 27	17 38	17 50	18 4	18 21	18 29	18 38	18 48	19 0	19 14
24	17 41	17 56	18 12	18 30	18 40	18 52	19 7	19 24	19 32	19 41	19 51	20 2	20 16
25	18 44	18 58	19 12	19 29	19 38	19 49	20 2	20 17	20 24	20 32	20 41	20 51	21 3
26	19 45	19 57	20 9	20 22	20 30	20 39	20 49	21 2	21 7	21 14	21 21	21 28	21 37
27	20 43	20 52	21 0	21 10	21 16	21 22	21 30	21 38	21 42	21 47	21 52	21 57	22 3
28	21 38	21 43	21 48	21 54	21 57	22 1	22 5	22 10	22 12	22 15	22 18	22 21	22 24
29	22 30	22 31	22 33	22 34	22 35	22 36	22 37	22 38	22 39	22 40	22 40	22 41	22 42
30	23 19	23 17	23 15	23 12	23 11	23 9	23 7	23 5	23 4	23 3	23 2	23 0	22 59
31	....	....	23 56	23 50	23 46	23 42	23 37	23 31	23 29	23 26	23 23	23 19	23 15
32	0 7	0 2	....	....	....	....	....	....	....	....	....	....	....

FOR NORTHERN STATIONS NOT ON THE MERIDIAN OF GREENWICH, AND FOR SOUTHERN STATIONS.

For northern stations not on the meridian of Greenwich.—For longitudes twelve hours or less west from Greenwich obtain the data for the given latitude from Table VIII for the given date and for the date following; for longitudes twelve hours or less east from Greenwich obtain the data for the given latitude from Table VIII for the given date and for the date preceding. Subtract the time on the earlier date from the time on the later and multiply the difference by the twenty-fourth part of the longitude in hours and decimals of an hour, positive if west, negative if east. Apply the product as a correction to the time on the given date.

For southern stations.—The instant of moonrise or moonset for any station south of the equator is that of moonset or moonrise, respectively, at a place of the same latitude north of the equator whose longitude is twelve hours different from that at the southern station.

If the southern station be twelve hours or less west from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day will be the same at the southern and northern stations. If, however, the phenomenon at the southern station occurs between midnight and noon, the local astronomical day at the northern station will be one day later than at the southern.

If the southern station be twelve hours or less east from Greenwich, and the phenomenon at that station occurs between noon and midnight, the local astronomical day at the northern station will be one less than at the southern station. If, however, the phenomenon occurs between midnight and noon, the local astronomical day will be the same at the two stations.

Having thus determined the true astronomical day at the northern station, compute by the rule for northern latitudes. For the desired local time of moonrise at the southern station change the time of moonset at the northern station twelve hours. For the desired local time of moonset at the southern station change the time of moonrise at the northern station twelve hours.

Example.—December 20, 1920, civil date, find the time of moonrise and moonset in longitude $4^h\ 43^m$ west from Greenwich and in latitude 33° 30′ south.

The longitude of the northern station is $7^h.3$ east from Greenwich and its latitude is 33°.5 N. Upon inspection of Table VIII it is seen that the astronomical day at the southern station is December 20 for moonrise and December 19 for moonset, the former phenomenon occurring between noon and midnight, the latter between midnight and noon. For the northern station, in accordance with the precepts given above, both phenomena are to be computed for December 20.

At northern station—

	Moonrise. d h m	Moonset. d h m
Table VIII, Lat. +33°.5	Dec. 19 0 21	Dec. 19 13 19
Table VIII, Lat. +33°.5	20 0 57	20 14 20
Difference	36	61
Product of Diff. by $-\frac{7.3}{24}$	−11	−19
Local astronomical mean time	0 46	14 1

At southern station—

	Moonset.	Moonrise.
Local astronomical mean time	12 46	2 1
Civil time	Dec. 20 12 46 A.M.	Dec. 20 2 1 P.M.

ON THE ARRANGEMENT AND USE OF THE AMERICAN NAUTICAL ALMANAC.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun, which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time, or by converting to mean time sidereal time determined by observations of fixed stars.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given for every even hour of Greenwich mean time on pages 6–29.

The Mean Solar Day is the unit of mean solar time, and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal

day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day coincides with the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Hence we have the following rules:

To Convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

To Convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the day.

To convert Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

Greenwich mean time, which at any fixed observatory is obtained by applying the longitude to the local mean time, on board ship is usually taken from the mean time chronometer set to Greenwich time.

Greenwich mean noon of any date means the noon at the beginning of the astronomical day.

THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–3 contain for every day throughout the year the *Right Ascension of the Mean Sun at Greenwich Mean Noon*, which is likewise the sidereal time of mean noon at Greenwich. The table at the foot of pages 2–3 contains the correction to be added to the right ascension of the mean Sun in order to reduce it to any Greenwich mean time other than noon. The correction is tabulated for every six minutes and can be interpolated to any time required. This reduction may also be made by using Table III, pages 110–111 of this volume, for reducing intervals of mean time to sidereal time.

The right ascension of the mean Sun is useful in converting mean solar time at any place into sidereal time. We first convert the given time from civil to astronomical and from local to Greenwich mean time; then from pages 2–3 take out the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time, i. e., the hour angle of the mean Sun, will give the hour angle of the vernal equinox, or the sidereal time required.

The right ascension of the mean Sun may also be used in converting sidereal time at any place into mean solar time. Find the Greenwich mean time of local mean noon, and from pages 2–3 take out for that time the right ascension of the mean Sun, which is the sidereal time of local mean noon. Subtract this from the given sidereal time and convert the interval of sidereal time thus found into mean time by means of Table II, pages 108–109, or by means of the table, *Correction for Longitude* at foot of pages 4–5. If the sidereal interval is less than $3^m\ 56^s.555$, there are two mean times corresponding to the given sidereal time, one a few minutes after the preceding noon, and the other a few minutes before the following noon, the mean time interval between these two mean times being $23^h\ 56^m\ 4^s.09$. The mean time, approximately known, will always show which one is to be taken.

The Sun's right ascension, that is, the right ascension of the true Sun, may be found by applying to the right ascension of the mean Sun from pages 2–3, the equation of time from pages 6–29, but applying it with the sign changed from that given on those pages.

Pages 4–5 contain, for every day throughout the year, the *Mean Time of Sidereal Noon at Greenwich*. The table at foot of pages 4–5 contains the correction to be applied to the mean time of sidereal noon in order to reduce it to any other meridian than that of Greenwich, this correction being additive for east and subtractive for west longitudes. This table may be used also to correct for any Greenwich sidereal time other than noon, the correction in this case being subtractive, and giving, when applied to the mean time of sidereal noon, a result which is 24^h – Right Ascension of the Mean Sun. The mean time of sidereal noon may be conveniently used for converting sidereal to mean time, or—which is the same problem—for finding the time of meridian passage of a star whose right ascension is known, by adding to the mean time of the *preceding* local sidereal noon, the mean time equivalent of the given sidereal time.

Pages 6–29 contain for every even hour throughout the year the *Sun's Declination* and the *Equation of Time;* interpolation may be made by inspection and is facilitated by the *H. D.* (*Hourly Difference*) which is given at the end of each day. At the end of the month is given the Sun's *Semidiameter* for every tenth day. The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth. The equation of time is the apparent time of Greenwich mean noon, or the hour-angle of the true Sun at that instant. When interpolated to any given Greenwich mean time, it is the correction to be applied to mean time in order to obtain apparent time. The Sun's semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object to the distance from the center of the Sun.

The Sun's right ascension and declination, as given by the Almanac, are referred to the true equator and equinox; are corrected for aberration, and are, therefore, apparent positions.

It is to be noted that here, as elsewhere throughout the volume, the positive sign used with declinations indicates north and the negative sign south.

As examples of the use of pages 2–29:—

1. Let the sidereal time be required for July 13, 1920, $10^h\ 3^m\ 30^s$, A. M., mean time, at a place whose longitude is 85° 15′, or $5^h\ 41^m$ west from Greenwich.

		h m s
Local astronomical mean time	July	12 22 3 30
Longitude from Greenwich (additive)		5 41 0
Greenwich mean time	July	13 3 44 30
		h m s
R. A. M. S. at G. M. N., July 13, page 3		7 24 15.3
Reduction for $3^h\ 44^m\ 30^s$, bottom of page 2, or Table III		+0 36.9
Add the local astronomical mean time		22 3 30.0
The required sidereal time (rejecting 24^h)		5 28 22.2

2. On July 13, 1920, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be $5^h\ 28^m\ 22^s.2$, and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$.

First solution.

	h m s
R. A. M. S. at G. M. N., July 12, page 3	7 20 18.7
Reduction for $5^h\ 41^m\ 0^s$, bottom of page 2, or Table III	+0 56.0
R. A. M. S. at local mean noon, July 12	7 21 14.7
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 28 22.2
Subtracting the first from the second gives the sidereal interval from noon	22 7 7.5
Reduction for $22^h\ 7^m\ 7^s.5$, bottom of page 5, or Table II	−3 37.4
The required astronomical mean time	22 3 30.1

Second solution.

		h m s
Mean time at Greenwich sidereal noon, page 5	July 12,	16 36 57.5
Reduction for longitude, bottom of page 4, or Table II		−0 55.9
Mean time of *preceding* local sidereal noon	July 12,	16 36 1.6
Add the given sidereal time		5 28 22.2
Reduction for $5^h\ 28^m\ 22^s.2$, bottom of page 4, or Table II		−0 53.8
The required astronomical mean time	July 12,	22 3 30.0

If there is any doubt about the mean time of the *preceding* local sidereal noon, the first solution is to be preferred.

3. Let the Sun's right ascension and declination be required for July 13, 1920, $10^h\ 3^m\ 30^s$ A. M., mean time, at a place whose longitude is 85° 15′, or $5^h\ 41^m$ west from Greenwich.

		h m s	h
Local astronomical mean time	July 12,	22 3 30	
Longitude from Greenwich (additive)		5 41 0	
Greenwich mean time	July 13,	3 44 30	−3.74

	Equation of Time.	*Sun's Declination.*
	m s	° ′
July 13, 2ʰ, G. M. T.	−5 30.5	+21 50.0
Change in 1ʰ.74	−0ˢ.3×1.74 −0.5	−0′.4×1.74 −0.7
	−5 31.0	+21 49.3

Sun's Right Ascension.

	h m s
July 13, R. A. M. S. at G. M. N.	7 24 15.3
Correction for 3ʰ 44ᵐ 30ˢ	+0 36.9
Eq. of Time (sign changed)	+5 31.0
	7 30 23.2

The sign + must be used with the H. D. when the equation of time or Sun's declination, if itself positive, is increasing, or if negative, is decreasing numerically; contrariwise, the sign − must be used with the H. D. when the equation of time or Sun's declination, if positive, is decreasing, or if negative, is increasing numerically.

Pages 30–75 contain for every even hour throughout the year the *Moon's Right Ascension* and *Declination*, referred to the true equator and equinox, and also the *Moon's Semidiameter* and *Horizontal Parallax*. The right ascension and declination are accompanied by the difference or change in every two-hour interval; by means of these differences, interpolation may be conveniently made to any Greenwich mean time by Table IV, *Proportional Parts*, pages 112–114, using the difference in two hours as the argument at the top of the page, and the interval from the nearest even hour of Greenwich mean time as the argument at the left-hand side of the page. The semidiameter and horizontal parallax may be taken directly from the Almanac without interpolation; they are required for all observations of the Moon.

Page 75 contains also the *Phases of the Moon* for the entire year; these are likewise to be found, as they occur, at the foot of pages 30–74.

Example.—Let the Moon's right ascension and declination be required for January 25, 1920, 11ʰ 10ᵐ, astronomical mean time at Greenwich.

The nearest even hour is 12; the interval is 50ᵐ; the difference or increase of right ascension in 2ʰ is 250; the difference of declination in 2ʰ is 231 and is northward, or positive. From Table IV with the arguments 50ᵐ and 250 take out the change in right ascension; and with the arguments 50ᵐ and 231 take out the change in declination. Subtract the changes, since the interpolation is here made backward.

	Right Ascension.	*Declination.*
	h m s	° ′
January 25, 12ʰ 0ᵐ	23 58 49	+ 4 6.1
Change in 50ᵐ	1 44	+ 0 9.6
January 25, 11ʰ 10ᵐ	23 57 5	+ 3 56.5

Pages 76–77 contain the Moon's mean *Time of Transit, Meridian of Greenwich*, accompanied by the difference in minutes between the times of day of successive transits. The local time of the Moon's meridian passage at any given place may be found from that at Greenwich by means of these differences, together with the longitude of the place measured from Greenwich and expressed in time, and Table IV, *Proportional Parts*, pages 112–114, using the differences between the times of successive Greenwich transits as argument

at the top of the page, and the longitude of the given place from Greenwich as the argument at the right-hand side of the page, the rule being to interpolate forward for west longitudes and backward for east longitudes.

Pages 78–93 contain the *Apparent Right Ascension* and the *Apparent Declination* of the four planets, Venus, Mars, Jupiter, and Saturn, for every Greenwich mean noon throughout the year, referred to the true equator and equinox, and the time of *Transit, Meridian of Greenwich*, given to the nearest minute. The apparent right ascensions and the apparent declinations are accompanied by the difference or change in every 24-hour interval. By means of these differences interpolations may be conveniently made to any Greenwich mean time by Table IV, using the difference as the argument at the top of the page and the Greenwich mean time as the argument at the right-hand side of the page. The time of transit meridian of Greenwich can be interpolated by simple inspection to any other meridian, by interpolating forward for west longitudes and backward for east longitudes. The *Semidiameter* and *Horizontal Parallax* of the planets are given at the foot of the pages, for the first day of each month.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The positions given in the Almanac are the geocentric coordinates of the center of the planet. The semidiameter and horizontal parallax, when appreciable, are required to reduce an observation from the planet's limb to the planet's center, and from the position of the observer to the center of the Earth.

Page 94 contains the *Right Ascension*, and page 95 the *Declination*, in a list of *Apparent Places* of 55 stars. The positions are given for the time of meridian passage at Greenwich on the first day of every month. On page 95 are found also the star's historical or *Special Name* and its *Magnitude*.

Page 96 contains for the same 55 stars the *Greenwich Mean Time of Transit at Greenwich* on the first day of every month. Page 97 contains the correction for reducing the data of page 96 from the first to any other day of the month.

Pages 98–99 contain the *Mean Places*, with their *Annual Variations*, of 110 *Additional Stars* for the beginning of the year 1920.

The right ascension of a star is also the sidereal time of its meridian passage. The mean time of meridian passage may, therefore, be roughly found from the right ascension by adding the mean time of sidereal noon at Greenwich from pages 4–5, or more accurately by the precept already given for the conversion of sidereal time.

The right ascension and declination of a star are required whenever it is observed for time, latitude, or azimuth.

Pages 100–103 contain the principal elements of the solar and lunar eclipses which occur during the year, together with maps of the regions in which the solar eclipses are visible.

The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51:50.

The principal circumstances of each total and annular eclipse of the Sun are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of November 10, 1920, begins and ends at Richmond, Va., whose latitude is $+37° 22'$ and whose longitude is $+77° 26'$.

For the beginning we compare the distance of the place from the curves of 2^h and 3^h and find it to correspond to about 4 minutes from the former, thus giving for the approximate time of beginning $2^h 4^m$; for the end we compare the distance of the place from the curves of 4^h and 5^h and find it to correspond to about 6 minutes from the former, thus giving for the approximate time of ending, $4^h 6^m$; and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.	Ending.
		d h m	d h m
Greenwich mean time	November	10 2 4	10 4 6
Longitude west		5 10	5 10
Local mean time	November	9 20 54	9 22 56

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relative to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit, the measurements being made upon a line drawn through the place perpendicularly to the central line.

Accurate computations of the times of the phases of solar eclipses for any place may be made by the use of formulæ given in the *American Ephemeris and Nautical Almanac* for 1920, pages 759 to 762.

Page 104 contains two examples of the computation of lunar distances which are inserted because lunar distance tables are no longer published.

Pages 105–106 contain the *Phenomena*, or the configurations of the Sun, Moon, and planets, expressed in the symbols of page x. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other, the predicted times are the instants when the two bodies have the same right ascension. In the case of conjunction the degrees and minutes to the right indicate the difference of declination. Thus, ☉ ☌ ☾ . . . . ☌ −4° 22′ would be read "Conjunction of Mars with the Moon, Mars 4° 22′ to the South."

Pages 107–150 contain a series of tables numbered from I to VIII.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—*Proportional Parts*, for use in interpolating positions of the Moon and planets.

Table V—*For Obtaining Approximately the Solar Ephemeris for Any Year 1921–1934 from that for 1920.*

Table VI—For finding the time of *Sunrise* and *Sunset* at any place between the equator and 60° north latitude.

Table VII—*Sunrise and Sunset for Southern Latitudes.*

Table VIII—For finding the time of *Moonrise* and *Moonset.*

GENERAL INDEX.

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